

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

1926	
Nov. 11	Schneider Cup Race at Norfolk, Virginia, U.S.A.
Nov. 16	Mr. A. G. von Baumhauer, Sub-Director of the Government Aeronautical Laboratories, Amsterdam. "Some Notes on the Possibilities of Progress in Aviation," before Inst.Ae.E.
Nov. 18	Mr. R. S. Capon. "Methods of Performance Testing and Analysis," before R.Ae.S.
Nov. 21	Lecture, "Meteorology in the Service of Msn.," by Dr. G. C. Simpson, C.B., at the Guildhouse, Eccleston Square, S.W.1.
Nov. 30	Mr. F. S. Barton, M.A., F.Inst.P. "Air Photography Apparatus," before Inst.Ae.E.
Dec. 2	Mr. P. B. Bradshaw. "Alloy Steels for Aero Work," before R.Ae.S.
Dec. 3-19	Paris Aero Show

EDITORIAL COMMENT.



Real Commercial Aviation

WHILE passenger air routes in Europe are struggling along by the aid of government subsidies, and this applies to Europe in general and not solely, nor particularly, to England, there is at least one branch of civil aviation which has so far managed to work out its own salvation, unaided by such artificial forms of encouragement as subsidies and grants and machines on the "hire-purchase system." Aerial Surveying, like other forms of aviation, has had its difficulties. In the first place the art, or science, whichever way one prefers to regard it, of aerial surveying, and more particularly surveying by means of aerial photography, has had to find its way. Experimental work of a considerable magnitude has had to be carried out. Special cameras have had to be evolved, and there still remains the rather difficult problem of making an exact allowance for the effect of uneven ground such as mountains and valleys, the former naturally appearing disproportionately large owing to the fact that they are nearer to the lens of the camera. However, it may be said that for all practical purposes these problems have been solved. When it is a question of an aerial photographic survey over country already fairly accurately mapped by previous ground surveys, the height of hills and mountains will be known, and in such cases the correct allowance for "distortion," if one may so term the phenomenon, can be made. Over unknown country the same accuracy will not in general be required and experienced operators, working always in conjunction with ground surveyors, can now obtain really remarkable accuracy in this respect.

It is, therefore, small wonder that aerial surveying has "caught on," to use a colloquialism, in the way it has. The work carried out by the Aerial Survey Company has demonstrated the enormous saving in time as compared with the older methods which air surveying can effect. Not only so, but by making use of aircraft under certain conditions, surveys

become possible which could not be made by any other means. The question of cost is always a relative one, and in air surveying it so happens that the cost is very low compared with that involved in the old method. Thus it comes about that here we have, ready to hand, a branch of civil aviation which is at once a commercial proposition. The Aerial Survey Company and the Aircraft Operating Company deserve every credit for having taken the lead in this branch of aviation, which, apart from the direct benefits to the companies directly concerned, must necessarily reflect favourably on British aviation in general, by the demand for machines and engines which it will create, and indirectly by the prestige which it will establish. Already we can claim to have established a leading position in this important branch of aviation, and every effort should be made not only to maintain but to increase this lead.

There is another side to the question of aerial surveying the value of which should not be overlooked. We refer to the experience with British aircraft in out-of-the-way places and under climatic conditions very trying for the machines. Experience is being gained and knowledge accumulated which must have a beneficial effect upon the development of aircraft design and construction. The behaviour of machines of different types under varying conditions; the manner in which different materials stand up to the extremes of cold and heat encountered; the treatments which have to be given to certain materials in order to protect them, problems such as these will be met with in the everyday work of air survey expeditions. The experience thus gained, if placed, as we have no doubt it will be, before the constructors of the machines concerned, cannot fail to assist very materially towards improved construction. Altogether air surveying is a branch of civil aviation (not forgetting its military and service value) which is worth watching very closely. As yet but a small beginning has been made. There is no telling how far this beginning will lead.

Small Three-engined Aeroplanes

On several occasions recently we have referred to the subject of small three-engined aeroplanes, pointing out that in many parts of the British Empire there should be a market for machines of this type, for use on air routes where the volume of traffic is not as yet great enough to justify the use of large machines, but where the reliability of the three-engined arrangement is essential to success. The particulars given this week of the new "Cirrus Mark II" engine brings this subject to the fore once more, the engine being one which, it would appear, might lend itself admirably to installation in a fairly small three-engined machine, apart, of course, from its obvious suitability for low-power two-seaters of more normal type.

If one looks into the figures for the "Cirrus, Mark II," one finds that the weight is 270 lbs. for a maximum power of 84 b.h.p. and a normal power of 78 b.h.p. In this connection it is of interest to note that the weight of the "Puma" is about 640 lbs. dry. The weight of three "Cirrus" engines would be 810 lbs. By the time one has added the weight of radiator and cooling water to the "Puma" the weight in running order will probably not be very far short of this figure. Now, one of the most successful small commercial aeroplanes ever built is the de Havilland

50 with "Puma" engine. The three "Cirrus" engines would develop approximately the same total power as the "Puma," and thus the D.H. 50 would seem to offer a suitable basis on which to work. This machine carries four passengers, or, expressed in another way, approximately 1,000 lbs. of paying load. Assuming that the weight of three "Cirrus" engines would be near enough the same as that of one "Puma," presumably one might expect to get, with the small three-engined machine, a paying load of, at any rate, somewhere near this figure. The placing of two of the three engines on the wings would probably somewhat alter the structure weight, and their extra resistance might be expected to lower the performance slightly, although with the small frontal area of the "Cirrus" the resistance should certainly not be unduly high. The top speed of the "Puma" D.H. 50 is, we believe, 112 m.p.h. at 3,000 ft. Even if the three-engined machine should sacrifice the odd 12 m.p.h., it would still be a very serviceable machine for many localities (it is not suggested that such a machine be used on the London-Paris route, for instance), while a paying load of somewhere in the neighbourhood of 1,000 lbs. should be sufficient for quite a large number of routes in various parts of the British Empire.

The Schneider Cup Race

The race for the Schneider Cup is, weather permitting, being flown to-day, November 11, at Norfolk, Virginia. The result will not, of course, be known in this country in time to be included in this week's issue of FLIGHT, although it will be known to our readers by the time this week's issue reaches most of them. The outcome is a matter for speculation. Last year there was very little hope of the Italian challenger beating the Americans. The type of machine sent over was, obviously, hopelessly outclassed. This year, however, it is rather a different story. The Macchi machines built for the race, judged from photographs, are very businesslike affairs, and frontal area appears to have been cut down to an absolute minimum. At the same time, the form of the fuselages is as carefully streamlined as possible, and, as the Fiat engines are reported to develop something like 800 h.p., the Italian challengers should have a very good chance.

The Americans, on the other hand, have not been idle, and have further "cleaned up" last year's machines, although this scarcely seemed possible. They are reported to have fitted Packard engines instead of the Curtiss engines used last year, although at the moment of writing this report has not been confirmed. The Americans have doubtless had a good deal more experience than the Italians, which will count for a great deal, although it is known that the challengers have been practising diligently. Both nations have, unfortunately, lost valuable pilots in training for the race, and this fact will inevitably cast a certain gloom over the proceedings at Norfolk.

As our readers will know, Great Britain is not represented this year, it having been decided to refrain from entering until next year. If the Americans win, the Cup will become their property as the winners three times in five years. Should the Italians win, presumably next year's race will be held in Italy. In that case there is every probability of Great Britain, and very probably France, entering machines.

THE COPPA D'ITALIA

Italian Light 'Plane Trophy Definitely Won by Czechoslovakia

OWING to lack of space it has not been possible until now to give particulars of the competition for the *Coppa d'Italia*, which concluded with a high-speed test during the middle of October, and which resulted in a win for Bican piloting an Avia B.H. 11 monoplane with Walter engine. This year's competition was the third, and the win by an Avia pilot resulted in the *Coppa d'Italia* becoming the permanent property of the Milos Bondy firm of Prague, whose machine, piloted by the late Dr. Lhota, won the cup last year, and the rules being that the winner of two out of three competitions retains the cup.

For this year's competition three nations were represented: three Italian machines, two Czechoslovak machines and two German. The eliminating trials, which were held at Montecelio, commenced on October 6 and included a low-speed test over a 3-km. course. The two Avia monoplanes went through their tests on the first day, and on the following day the Udet machine completed its eliminating tests. In the afternoon Dr. Lhota went for a flight in order to test his machine for climb and descent, presumably in view of a climb to 1,000 m. being a part of the high-speed test. On this flight, which was purely a test flight and not an official attempt in the competition, Dr. Lhota was accompanied by his mechanic Volejnik,

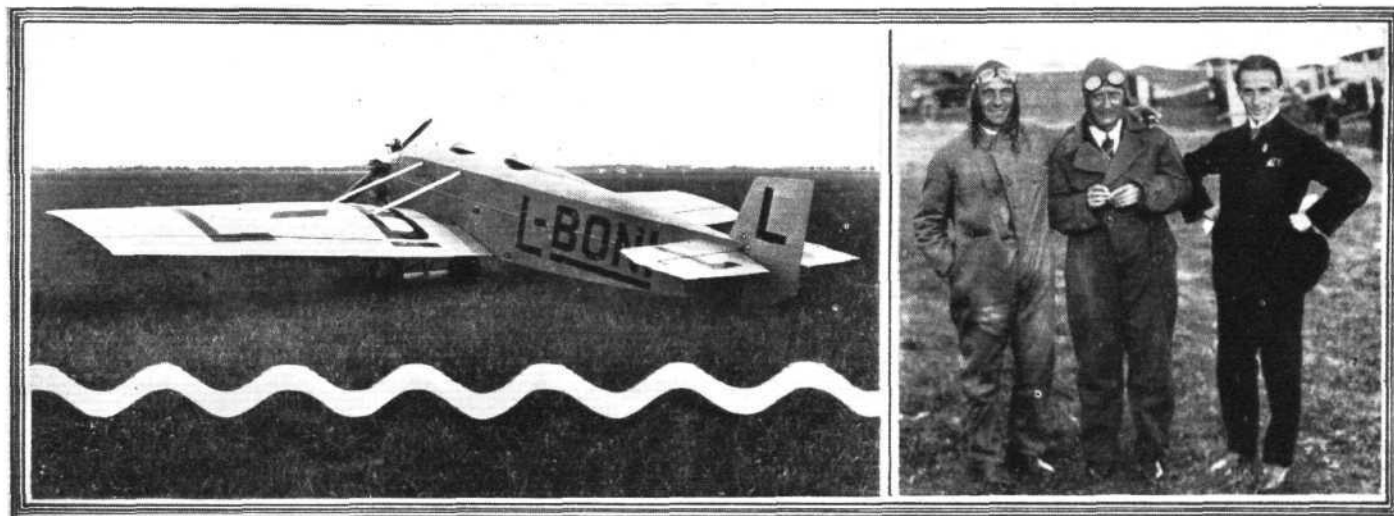
and then came down to an altitude of about 50 m. to cross the starting line in flight, the other competitors following at intervals of 1 min. Sartori, on one of the Macchi machines, abandoned the race in the second lap and Canzini abandoned in the third circuit. In the meantime Bican continued lapping with the regularity of a watch, and completed the 300-km. course an easy winner.

The classification in the *Coppa d'Italia* was according to the following formula:—

$$X = V_m \frac{C_u \cdot V_{max}}{C_t \cdot V_{min}}$$

in which V_m is the mean speed in kilometres per hour, *i.e.*, the distance of 301.5 km. divided by the sum of the times taken over the course and for the climb to 1,000 m.; V_{max} the high speed over the 3-km. course; V_{min} the low speed over the 3-km. course; C_u useful load, which included pilot, passenger and ballast but excluded fuel and oil, and C_t the total amount of fuel and oil used.

In the following table particulars are given of the various figures obtained by the three machines which completed the high-speed course. By way of comparison, the figures



WINNERS OF THE 1926 "COPPA D'ITALIA," AND PERMANENT HOLDERS OF THE CUP : On the left the "Avia" B.H.11, with 60 h.p. Walter engine, on which Bican won this year's competition. The group on the right includes Bican, pilot of the machine, Kinsky, his passenger, and Kopecky, Secretary of the Aero Club of Czechoslovakia.

who, it will be remembered, was also with Dr. Lhota at the French competition at Orly. It is not quite clear what happened, but having reached a considerable altitude the Avia machine was seen to come down in an almost vertical dive with engine running. The speed attained was, of course, very high indeed, and suddenly the wing fabric became detached and the machine crashed into the ground at terrific speed, Dr. Lhota and his mechanic being killed instantly. It seems incredible that a pilot of Dr. Lhota's experience should deliberately carry out such a manoeuvre, and it has been suggested as a possible explanation that an elevator control may have broken. Whether this was actually so will probably never be known, but the particular Avia machines used in the competition were not designed for aerobatics, and the makers of the machine, in fact, prohibited any kind of aerobatics. It would therefore seem very unlikely that Dr. Lhota would deliberately dive the machine vertically with the engine running at full throttle. The death of Dr. Lhota was a severe blow to Czechoslovak aviation, and cast gloom over the proceedings in Italy, further tests being deferred until October 12. On this and the following day the remaining competitors passed their eliminating tests, etc.

The final part of the competition consisted in a high-speed test over a triangular course of 35.5 km., preceded by a climb to 1,000 m. At the end of the first and second circuit of the course the maximum speed was measured over a 3-km. course. The first to get away for the climb and high-speed test was Bican on the "Avia," who at once made his climb to 1,000 m.

obtained by the Messerschmitt monoplane with Bristol "Cherub," engine which took part *hors de concours* are included in the table.

Results Obtained in "Coppa d'Italia"					
Machine	Avia B.H.11	Macchi M.20	Udet U.12	Messerschmitt*	
Engine	Walter 60	Anzani 55	Siemens 80	Bristol "Cherub"	
Pilot	Bican	Rustici	Sönning	Von Conta	
Place	1	2	3	—	
Useful load (lbs.)	528	407	519	385	
Minimum speed (m.p.h.) ..	41.8	43	43.4	55.8	
Time over course	2 06 13	2 31 50	2 29 39	2 50 55	
Climb to 1,000 m.	0 12 00	0 20 00	0 14 00	0 14 00	
Total time ..	2 18 13	2 51 50	2 43 39	3 04 55	
Formula speed (m.p.h.) ..	81.3	65.2	68.6	48.0	
Petrol Cons. (lbs.)	76.5	74.2	120.0	—	
Oil cons. (lbs.) ..	4.12	4.4	16.1	—	
Total cons. (lbs.)	80.62	78.6	136.1	39.6	
Points scored ..	1,968	1,010	787	—	
Corrected high speed (m.p.h.)	95.6	79.8	80.7	72.8	

* Took part in competition *hors de concours*.

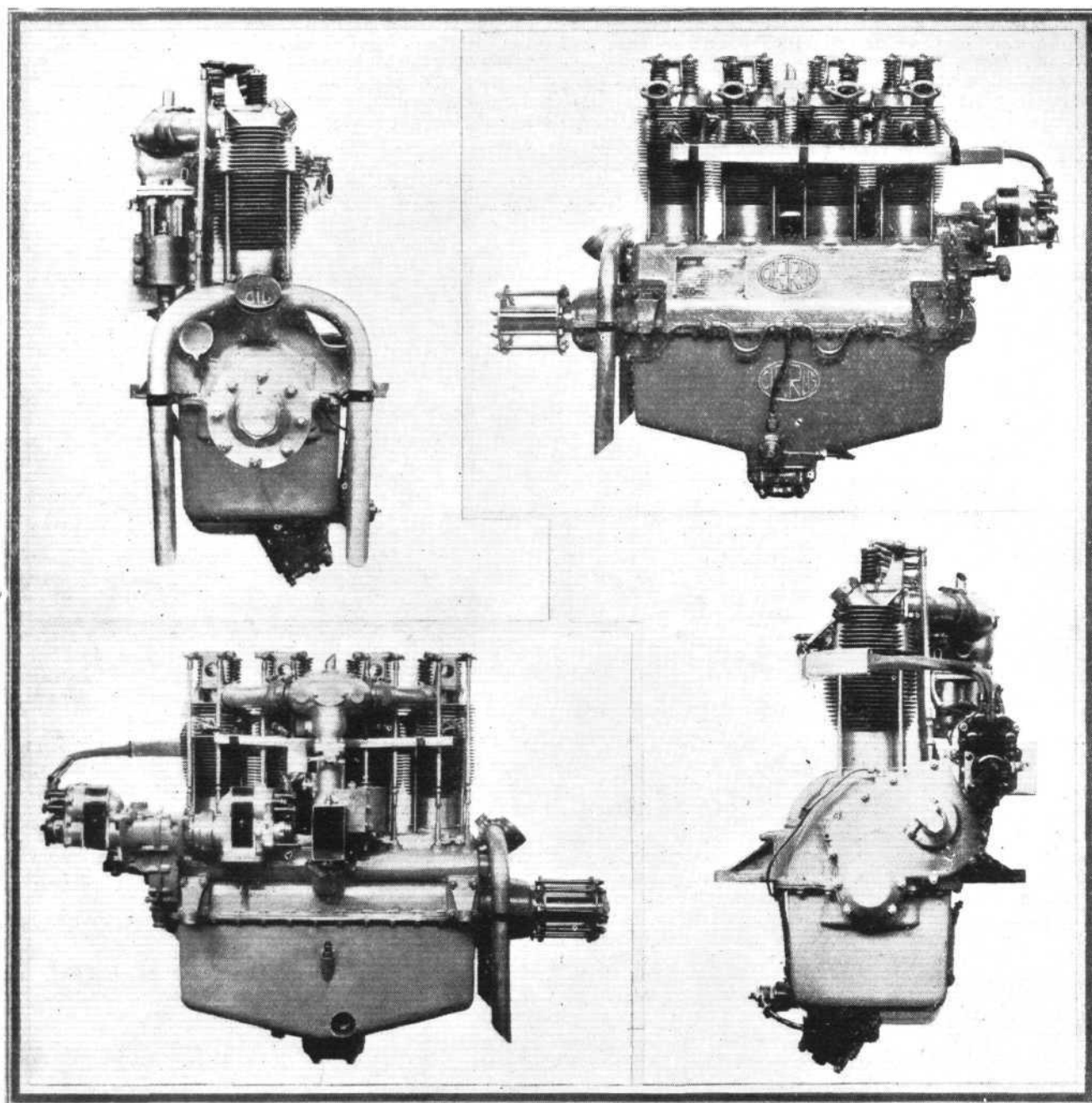
THE "CIRRUS MARK II" ENGINE

84 B.H.P. at 2,000 R.P.M. ; Weight, 268 lbs.

An increase of 5 mm. in the bore, slightly different cylinder heads, and different connecting rods—these are the main changes which have resulted in an increase in maximum power of from 65 h.p. at 2,000 r.p.m. to 84 h.p. at the same speed, of the "Cirrus Mark II" engine, as compared with Mark I. At the same time the total weight remains to all intents and purposes the same, *i.e.*, 268 lbs. (122 kg.). When the "Cirrus Mark I" was first produced by A.D.C. Aircraft, Ltd., early in 1925, it was designed mainly for the De Havilland "Moth" low-power two-seater, the first of which was then

the "Cirrus-Moth" is simple to fly and maintain, and engine troubles are practically unknown.

When the "Cirrus" was first brought out there were many who sniffed somewhat contemptuously at an engine weight of 4 lbs./h.p. Practice has shown, however, that this is not a serious objection, and the De Havilland "Moths" fly very strongly with the Mark I "Cirrus." Their climb, although not spectacular, is sufficiently good for most conditions, and altogether the heavy engine has not shown itself to be such a drawback as some had expected. Running

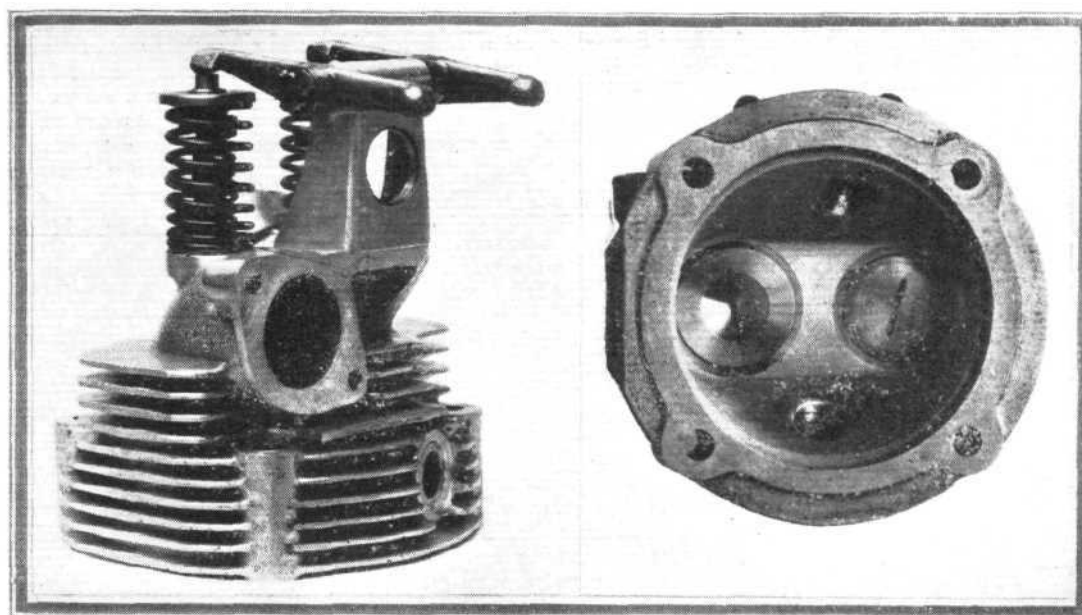


THE "CIRRUS MARK II" ENGINE : Developing a normal power of 78 h.p. at 1,800 r.p.m. and a maximum of 84 h.p. at 2,000 r.p.m., this engine weighs 268 lb. (122 kgs.), giving a specific weight of 3.2 lbs. per h.p.

nearing completion. Low first cost, ease of maintenance, and reliability were the main considerations which influenced the design of the "Cirrus," and how well Major Frank Halford succeeded in attaining his aim is now a matter of common knowledge to the world, the "Cirrus-Moth" combination having been not only in hard and regular use at all the light aeroplane clubs in this country, but used extensively in the Dominions, notably in Australia, while large numbers of these machines have been purchased by private owners at home and abroad. From all sides one hears the same report—

and maintenance costs have, on the other hand, been almost ridiculously small, while the reliability has been such that the idea that a "Cirrus" might fail never occurs to a pilot, and such few instances as have occurred are quite naturally regarded as quite surprising—as much so, in fact, as the failure of a car engine. When this state of affairs is reached, we are approaching the reliability that *should* obtain in aircraft used by private owners, and the pronounced success of the De Havilland "Moth" is easily understood.

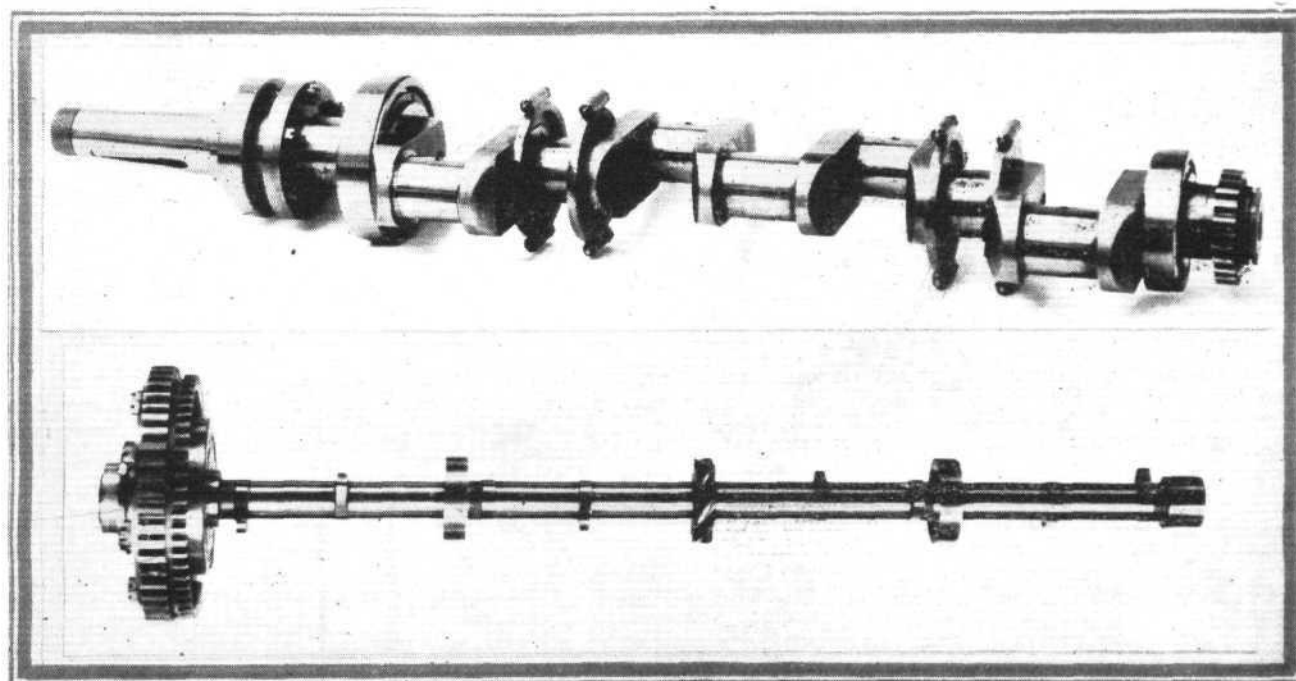
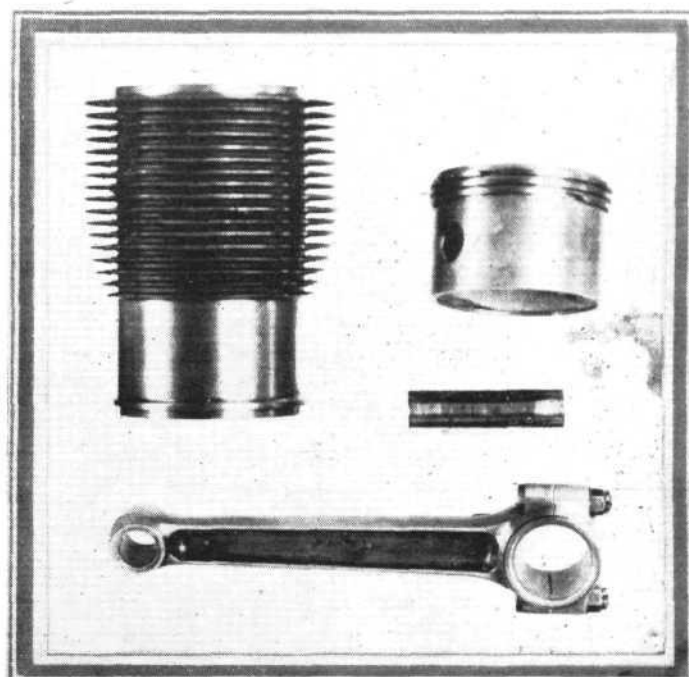
While thus the "Cirrus Mark I" has done all that might



The "Cirrus Mark II" engine: On the left an external view of a cylinder head, and on the right a view inside the head. The inlet valve is on the left.

reasonably be expected of any aero engine, its designer did not regard it as the last word, and he consequently set to work to produce a slightly more powerful version, the Mark II. As already mentioned, the alterations to the older engine necessary to increase the power from 65 h.p. to 84 h.p. at the same speed of revolution were but small, although an increase in power of more than 29 per cent. is, under certain circumstances, very well worth having, especially as it has been attained without increase in weight and, as far as can be judged at the moment, without any sacrifice in reliability. For instance, the private owner who has habitually to take off from rather restricted spaces will find the extra power very useful. One may also imagine the use of machines in hot climates where there is less "lift" in the air, and where consequently a greater nominal power reserve is desirable. Similarly, for operating from aerodromes situated at a considerable altitude above sea level, slightly greater power than that given by the Mark I engine is to be welcomed, and so it is not difficult to see the reason for the production of the Mark II "Cirrus" engine. Again, for small seaplanes in hot climates a slight increase in power would doubtless be useful, although the Short "Mussel" is an excellent demonstration of what can be done in this way even with the original "Cirrus."

From what has been said in the foregoing it will be clear that the "Cirrus" Mark II does not supersede the older model, but offers a very useful choice between two models, according to individual requirements. Many will doubtless find the older model quite sufficient for their needs, but for those who desire, for some reason or another, a slightly more powerful

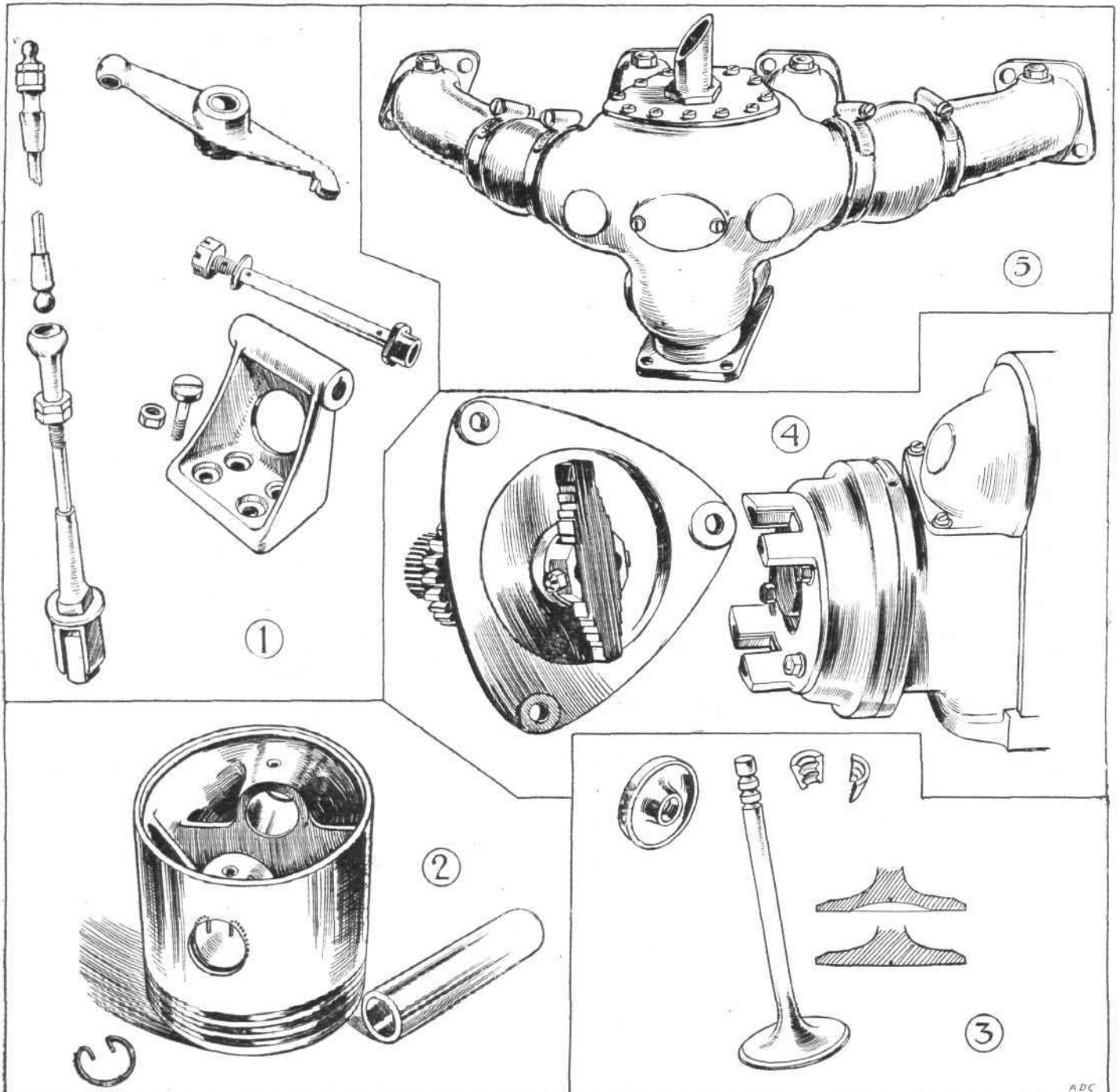


Crankshaft and camshaft of the "Cirrus Mark II" engine, and, above, a cylinder, piston, gudgeon pin and connecting rod.

engine, the Mark II is now available. Incidentally, it should be pointed out that the newer engine passed its Air Ministry type tests some time ago, so that machines fitted with it are eligible for their airworthiness certificate.

A detailed general description of the Mark II "Cirrus" is scarcely necessary in view of the fact that it is, with a few exceptions, identical with the older model, and, in fact, will fit the standard engine bearers of the Mark I, so that for use

is of the metal-to-metal type. A small change has been made in the shape of the cylinder-head casting, which results in a much simpler job. The rocker arm brackets, which were cast integrally with the head in the older model, are now a separate piece in the form of a Duralumin forging, bolted to the head. A free air passage between the valve domes is thus obtained. The two valves in each cylinder are placed in a very "clean" combustion chamber, as the view of the inside of a cylinder



["FLIGHT" Copyright Sketches]

THE "CIRRUS MARK II" : Some constructional details. In 1 are shown details of the mounting of the rocker spindle, the adjustments of the push rods, and the arrangement for Tecalemit lubrication of the rockers, &c. 2 shows a piston with piston rings, gudgeon pin and circlips. Details of the valves are shown in 3, the cupped valve being the inlet. The flexible magneto drive is illustrated in 4, while 5 shows the somewhat unusual induction manifold. This is exhaust heated, and the two outer branches are flexibly connected to the fixed centre portion by short lengths of rubber pipe secured by "Jubilee" worm-drive clips.

in machines hitherto fitted with the original "Cirrus" the substitution of the new model is a very simple matter indeed.

The four air-cooled cylinders are generally similar to those of the older engine, but are slightly larger to the extent that their bore has been increased from 105 mm. to 110 mm. The stroke remains as before, 130 mm. The cylinder barrels, with their fins, are of cast iron, while the cylinder heads are of aluminium, and are held down by four long bolts to the top of the crankcase. The joint between the head and the cylinder

head will show. They take their seats, not on steel valve seats, as in the Mark I, but on phosphor-bronze seats expanded into place in the head casting and held in position by the expanding only, no other form of locking of the seats being provided.

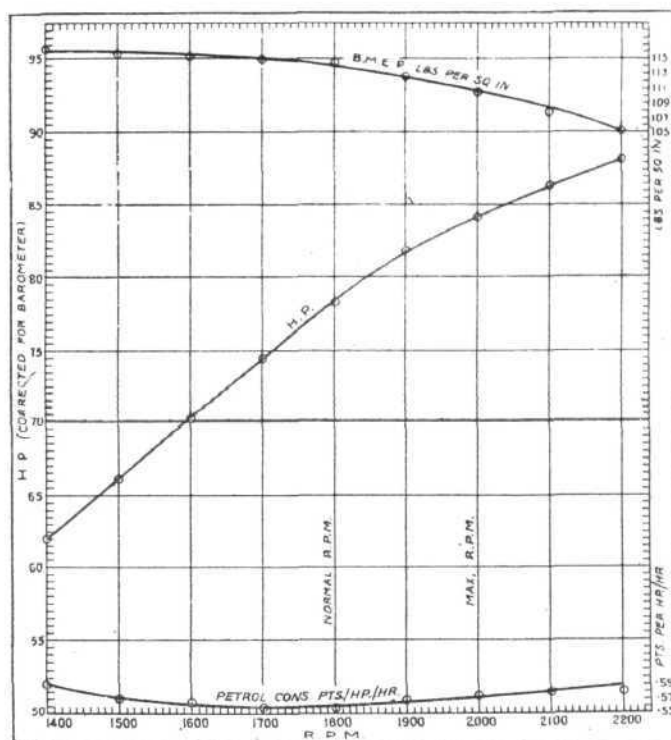
The valves are operated by push rods from the camshaft located inside the crankcase. Duralumin tubes are used for the push rods, and two adjustments are provided in each push rod, one set at the top and another a short distance

above the crankcase. The upper adjustments can thus be reached without removing the engine cowl, and it is not until a very great amount of "play" has to be taken up that it becomes necessary to make use of the lower adjustments. Ball and socket joints are used between push rods and rocker arms, and small Tecalemit lubricating cups are fitted which ensure the lubrication of the rocker arms.

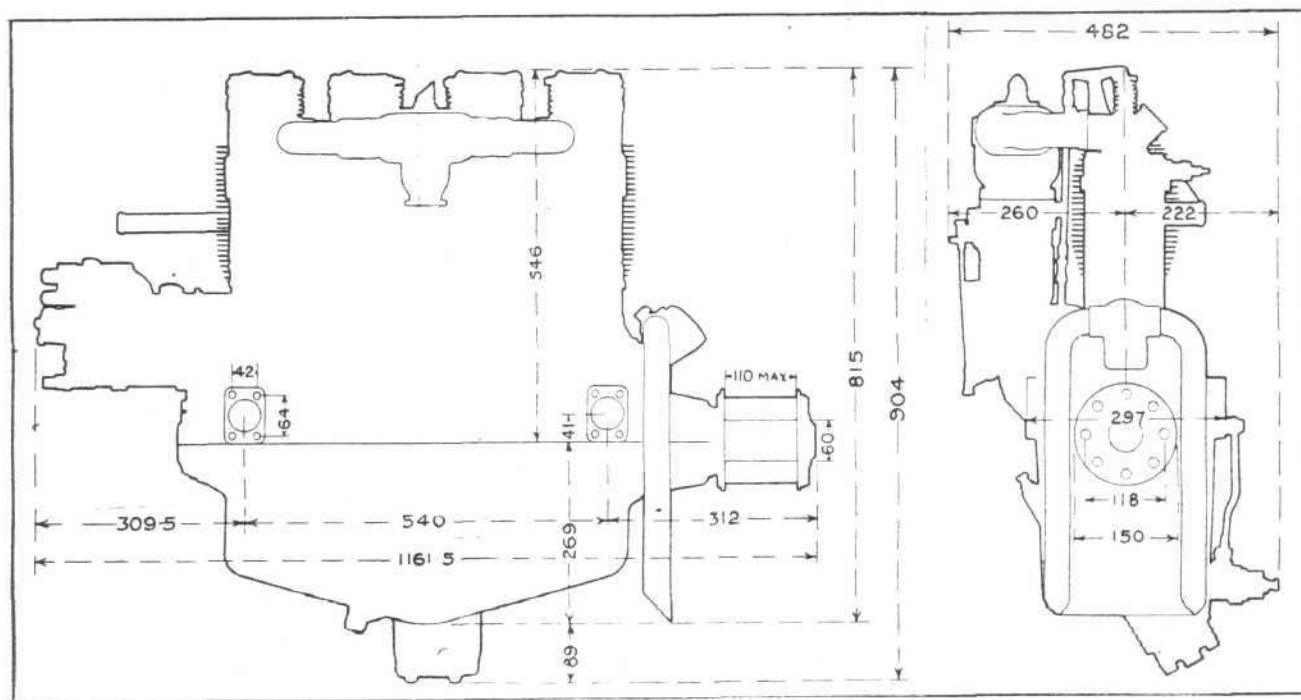
The crankshaft differs slightly from that of the older engine, and the thrust is now taken on a deep-track ball bearing housed in the front of the crankcase. By a very slight difference in the machining of this housing the engine can be used as a pusher. As in the older model, lubrication is partly by pressure pump feed and partly by splash, the crankcase having an oil sump of large capacity from which the oil is forced, by a submerged pump, to the main bearings and splashed to the gudgeon pins and cylinder walls. The aluminium pistons have a slightly different ring arrangement from those of the Mark I engine, the three rings now being at the top of the piston, with the lower ring acting as a semi-scraping ring. The connecting rods are Duralumin forgings of H-section, with plain white-metal bearings for the big ends, and the gudgeon pins taking their bearing direct on the Duralumin of the small ends. The gudgeon pins, incidentally, float in the piston walls and are held in place by circlips.

The induction system of the "Cirrus" Mark II is slightly different—or, rather, the manifold itself is of a different shape—and is supplied from a dual carburettor, one induction passage supplying the two inner and another the two outer cylinders. Exhaust heating of the induction manifold is provided.

As regards the running characteristics of the Mark II "Cirrus," the accompanying power and consumption curves show that at the normal speed of 1,800 r.p.m. the engine develops about 78.5 h.p., while at the maximum permissible speed of 2,000 r.p.m. the power is just over 84 h.p. With a



The "Cirrus Mark II" Power and consumption curves.



The "Cirrus Mark II" engine: This installation diagram should enable aircraft designers to see how the engine will "fit into" their designs. The engine fits the same bearers as those used for the Mark I.

compression ratio of 4.9 to 1 the fuel consumption is very low, just over 0.56 pints per horse-power per hour at 1,800 r.p.m., and 0.575 pints per horse-power per hour at 2,000 r.p.m. As the normal speed is sufficiently low to give good propeller efficiency, the simplicity of the direct drive used is obtained without sacrifice. Incidentally, it should

be mentioned that the tests to which these curves refer were run on "Shell" aviation spirit without the addition of benzol, while the lubricant used was Castrol "R."

Further particulars of the "Cirrus" Mark II engine may be obtained upon application to A.D.C. Aircraft, Ltd., Regent House, 89, Kingsway, London, W.C. 2.

Bedford Balloon Accident Sequel

ARISING out of the balloon accident at Kempston, near Bedford, on August 3 last, when Capt. E. T. Willows and four passengers were killed, proceedings, under the Air Navigation Consolidation Order of 1923, and the Air Navigation Act of 1920, were taken against C. G. Spencer and Sons, Ltd., of Highbury, for allowing a balloon to be flown without special permission, and without it being certified as air-

worthy. The Magistrates convicted on both summonses. In the case of the failure to have a permit they imposed a fine of £100. With regard to the failure to have an airworthiness certificate, they agreed that the phrasing of the temporary certificate was ambiguous, and imposed a penalty of £50. The costs were fixed at 30 guineas. They declined to state a case, but agreed to accept a notice of appeal at Quarter Sessions.

SOME "MOTH" STATISTICS

ONE of the outstanding events in civil aviation of recent years has been the instant and widespread popularity of the De Havilland "Moth" low-power two-seater. From the very first this machine was "right," although minor improvements in constructional details, mainly concerned with robustness under hard wear, have naturally been effected. In paying a tribute to this machine, one should not overlook the part played in its success by the "Cirrus" engine, with which it is equipped as standard. This engine has established a reputation for reliability such as has rarely been attained by an aero engine, and has thus contributed a great deal towards the popularity of the "Moth." Recently some statistics have become available which give "chapter and verse," as it were, for the reasons of the success of the "Moth," and we think our readers will find these interesting reading.

It is estimated that "Moths" have flown, in various parts of the world, an aggregate distance of some 580,000 miles, representing about 8,280 hours' flying. No less than 135 *ab initio* pupils have qualified on "Moths" for their Royal Aero Club certificates and Air Ministry "A" licences. This number of pupils, which may appear small in proportion to the number of flying hours, is, of course, due to the fact that the light aeroplane clubs have many members for each machine in use, and that thus there are probably several hundred partly-trained pupils who are ready to pass their flying tests. The figures include also the flying done by a number of private owners. *No serious accident on a "Moth" has ever been recorded.*

The De Havilland School of Flying was equipped with "Moths" in October, 1925. In just over one year 46 *ab initio* pupils have been trained, the average time taken to advance to the "solo" stage being seven hours on dual instruction. It has been found that after 12 hours' solo, or a total of 19 hours in the air, pupils require only about

one hour's dual instruction on D.H.9 machines fitted with Armstrong-Siddeley "Jaguar" engines.

As regards the flying qualities of the "Moth," these cannot well be tabulated and shown as statistics, but experience has shown that these machines, although quite stable and "docile," represent quite accurately the service types, the controls being generally similar to those of the more powerful machines. A pupil who can successfully land a "Moth" can master the service type in a very short time.

From the point of view of cost of running and maintenance the "Moth" appears to be equally satisfactory. Figures carefully compiled from records of actual flying experience over one year show that, on average school work in training officers of the R.A.F. *ab initio*, candidates for the Auxiliary Air Force, and private pupils, the cost of replacements was extremely low, being 2s. 2½d. per hour for engine replacements, and 2s. 1d. per hour for aircraft replacements. On a mileage basis the total cost of machine and engine replacements is equivalent to 0.7d. per mile.

Two "Moths" of the London Aeroplane Club completed 470 hrs. 20 mins. flying between August 20, 1925, and February 8, 1926, for a total replacement cost (for machine and engine) of £21 11s. 2d., which corresponds roughly to 0.19d. per mile.

These figures refer, of course, to the standard "Moth" with "Cirrus Mark I" engine. "Moths" can now be obtained fitted with the new "Cirrus Mark II," which gives the machine a slightly better performance, as follows: Top speed, 96 m.p.h. (154.5 km./h.); stalling speed, 41 m.p.h. (66 km./h.); rate of climb at ground level, 650 ft./min. (33 m. per sec.); climb to 5,000 ft. (1,525 m.) in 9.3 mins. Range at cruising speed, 4 hrs. The petrol consumption of the "Cirrus Mark II" under average conditions is about 4.25 gallons per hour (19.3 litres per hour), while the oil consumption is 1 pint per hour (about 2 litres per hour).

AIR MINISTRY NOTICES TO AIRMEN

Index.—October 15, 1926

It is notified that the Index dated April 1, 1926, is cancelled and a new one substituted therefor:—

This enumerates the Notices to Airmen cancelled, including (a) Notices which are cancelled through incorporation in the Air Pilot or Air Pilot Monthly Supplements.

(b) Notices notified as cancelled previously or which need no longer be retained.

Note.—Among the Notices in class (b) are certain Notices which were issued to call attention to Orders in Council. The cancellation of such Notices in no way affects the Orders in force.

Also the Notices to Airmen both General, Home and Foreign, which will remain operative until further notice.

To facilitate reference an indication of the principal contents of a Notice is given if this is not made clear by the title. If part of a Notice has been cancelled this also is indicated.

Croydon: Air Light. Manston: Landing Regulations

1. *Croydon.*—The cone-shaped air light at Croydon aerodrome will be dismantled shortly. The light will cease to function on the 18th inst. This light will be replaced by a Neon air light, particulars of which are as follows:—

Position.—In S.W. corner of Croydon aerodrome, and on W. side of the main road. Lat. 51° 21' N.; Long. 0° 08' W.

Nature and Character of Light.—1 red, occulting, 2 secs. (TC2r13₁₀.)

Visibility in Clear Weather.—45 miles.

English Candle Power.—13,700.

Description of Structure.—16 Neon tubes, each 20 ft. long, mounted at a small angle to the vertical on a steel tower erected on a disused chimney.

Description of Light.—Situated approx. 280 ft. (85 metres) above sea level; approx. 46 ft. (14 metres) above ground level. The light is only operated when due notice that an aircraft may arrive between sunset and sunrise has been given to the C.A.T.O. Croydon. A red occulting light is exhibited every 2 seconds as follows:—

Light 1 second; eclipse 1 second.

2. *Manston.*—Pilots approaching Manston aerodrome with the intention of landing must not fly across the roads which intersect the aerodrome at a height below 50 ft. (15 metres), owing to the possibility of danger arising to

the general public when these roads are crossed at a low altitude.

(No. 67 of 1926).

Air Navigation Directions, 1926 (A.N.D.6)

1. The Air Navigation Directions, 1922 (A.N.D.3), and amendments thereto (A.N.D.3 A-F) are about to be superseded by a consolidated and revised edition, incorporating numerous modifications, entitled the Air Navigation Directions, 1926 (A.N.D.6).

2. These new Directions will come into force upon November 15, 1926, and will be obtainable on and after November 6, 1926, from the Sales Offices of H.M. Stationery Office or through any bookseller, price 6d. net.

(No. 72 of 1926.)

Examination for Air Navigators

An examination for 1st and 2nd Class Air Navigators' licences will be held at the Air Ministry, Gwydyr House, Whitehall, on Monday and Tuesday, December 6 and 7, 1926.

Application forms, the syllabi, and conditions of examination, may be obtained on application to the Secretary, Air Ministry (C.A.2), Gwydyr House, Whitehall, London, S.W. 1.

Formal applications to sit at this examination should be received at the above address not later than November 29, 1926. Candidates should give, with their applications, full details of any qualifications and experience they already possess.

Before a licence can be issued, candidates will have to pass a medical examination at the Central Medical Board, 5-6, Clements Inn, London, W.C.2. Arrangements can be made for this examination to take place on December 8, 1926, if candidates make early application to be examined on that day.

(No. 73 of 1926.)

NOTICE TO GROUND ENGINEERS

Separating Clips for Streamline Bracing Wires

It is notified a case has occurred in which the brass clip, acting as acorn between duplicate streamline wires, has worn considerably into one of the wires so as to render the wire unserviceable.

Immediate action should be taken to examine the wires under all such clips to ascertain whether any wear has taken place. Damaged wires should be replaced forthwith.

(No. 3 of 1926.)

FROM THE FOUR WINDS

Hamburg's Growing Air Traffic

In so far as actual air traffic is concerned, Hamburg is now Germany's leading air-port. Whereas in August, 1924, the traffic totalled 279 planes, carrying 352 passengers and 3,822 tons of mails and freights, in August last, it totalled 952 planes, carrying 2,862 passengers, and 37,219 tons of mails and freights. The traffic is chiefly that of the main international air routes in which German and foreign lines participate.

Of these figures for August last, 685 of the machines, 1,681 passengers, 18,624 tons of freight, and 7,620 tons of mails, formed the German share of the traffic, the remainder being foreign.

The 1926 Coupe Breguet

This year's competition for the Breguet Cup has been won by Adjutant Duroyon on a Potez XV, with 400 h.p. Lorraine engine. His speed was 202.651 km. per hour (125.6 m.p.h.).

Forced Landing in Street

A GERMAN aeroplane flying very low over Hamburg some time ago developed engine trouble, and the pilot had to alight in the street in front of the Borgweg railway station. No one was injured, and the only damage done was to the undercarriage of the machine.

Rome-Berlin Air Line?

FROM Germany it is reported that negotiations are proceeding between the Italian Aero Lloyd and the German Air Hansa for the establishment of an air service between Rome and Munich via Bologna and Milan. Should the new line come into being, it will link up by air line the German and Italian capitals.

The Paris Aero Show

This year's Paris Aero Show promises at last to be of a really international character. In addition to the usual French exhibits, we understand that Germany will be represented by Junkers and possibly Udet, Italy by the Pisa works, manufacturing Dornier machines, Czechoslovakia by Milos Bondy and Co., and England probably by two or three firms.

An Australian Flying Record

CAPT. JOHNSTONE, of the Royal Australian Air Force, recently flew from Long Reach to Melbourne, a distance of 1,100 miles, in 10 hours. This is claimed to be a record for a one-day flight in Australia.

Deputy Director of Civil Aviation

A NEW post has been created at the Air Ministry—that of Deputy Director of Civil Aviation, which may be said to replace the post of Deputy Director of Air Transport, now abolished. Mr. F. G. L. Bertram, who has been associated with civil aviation matters for some years past, has been appointed to this new post.

Coste and Rignot Carry On

THE French pilots, Lieut. Coste and Capt. Rignot, who recently put up a record non-stop flight from Paris to Djack (or Jask) on the Persian Gulf, continued their flight eastwards on November 1 and flew to Karachi. They set out again next day with the intention of making a non-stop flight to Calcutta. Their Breguet XIX A2 (500-h.p. Hispano-Suiza) passed over Allahabad that afternoon, but did not

reach Calcutta as expected, and some anxiety was felt as to their safety by the gathering that waited to welcome the airmen at the Dumdum Aerodrome. However, they turned up safely on November 3, and the next day they made a non-stop flight of 9 hours to Delhi on their return flight.

Japanese Honours for U.S. World Flyers

THE Japanese Government has informed the U.S. War Department that it intends to award decorations to the six American airmen who flew round the world in 1924.

A Franco-German Air Agreement

THE French and German Governments have concluded an agreement whereby individual flights by private aeroplanes of either country may be permitted over territory of the other country without previous authorisation.

Australian Pacific Flight

GROUP-CAPT. WILLIAMS, who is carrying out a survey flight of the South Pacific Islands on a D.H.50 seaplane, reached Tulagi, Solomon Islands, on November 5. On reaching Roviana later, however, a leak developed in the engine water jackets, and as only a temporary repair can be made, it is feared that the flight will have to be abandoned and Capt. Williams will fly back to Australia.

Russo-German Airways Contract

A CONTRACT was signed in Moscow on November 6 regarding the immediate development of the Beru Luft, or German-Russian Airways Co., whereby this company will in future work the services between Berlin and Moscow instead of between Koenigsburg and Moscow.

Basel-Frankfurt Air Service

AN experimental winter air service between Basel and Frankfurt has been opened. It is a daily service, in both directions, and will remain in operation until next March.

A North Sea Air Route

PLANS for a North Sea route, probably between Hamburg (connecting Oslo) and Harwich or Felixstowe, is under consideration, the service to be put into operation early next year.

Aerial Map of Delaware State

THE 20th Photo Section at Langley Field, Va. (U.S.A.) has just completed an aerial mosaic map of the State of Delaware. Two photographers, Sergt. V. H. Merson and Staff-Sergt. H. L. Chestnutt, were employed on this work, the pilot being 1st Lieut. G. C. McDonald.

A Bolivian Air Crash

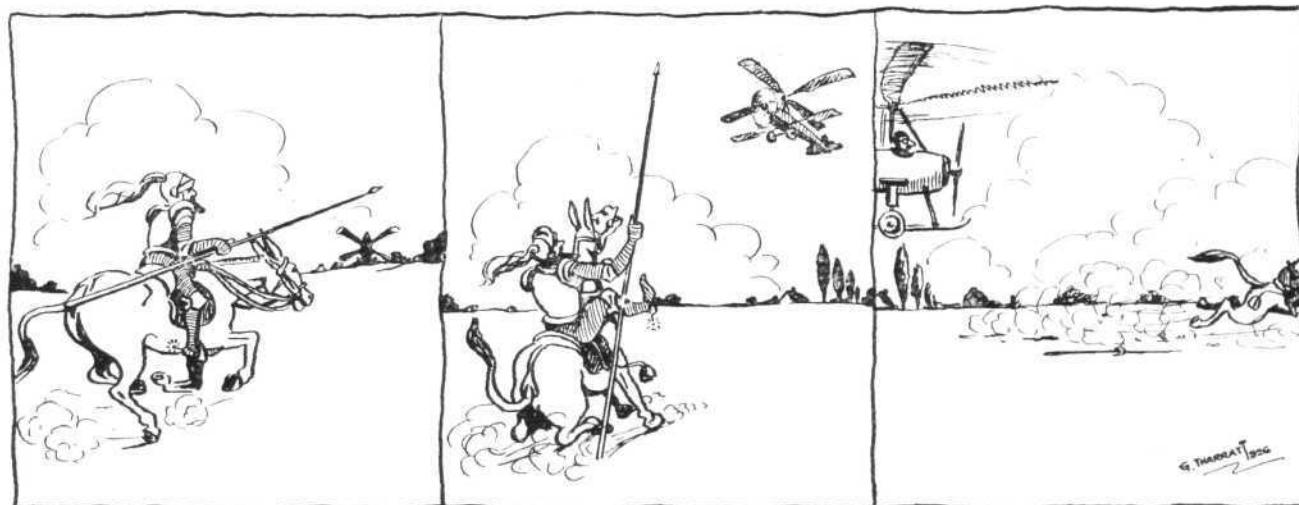
A FATAL aeroplane accident occurred near Santa Cruz on November 6, when a Junkers machine, with the Bolivian Consul at Arica and three other passengers, including a woman, on board, crashed. All four passengers, together with the pilot and mechanic, were killed.

Brazilian Atlantic Flight

SEN. DE BARROS, the Brazilian pilot, and his companions, who are attempting a flight from Genoa to Brazil in a Savoia S.55 twin-flying boat, left Las Palmas (Canary Is.), on November 8, en route for Porto Praia, Santiago. They had to come down, however, at the island of Fogo, Cape Verde Islands.

Sir Alan Cobham at Albert Hall

A REMINDER to readers that Sir Alan will lecture on his long-distance flights on Saturday at 2.30 and 8.30 p.m.



IF DON QUIXOTE LIVED TODAY: The tables turned.

THE EFFECT OF REDUCED INTAKE-AIR PRESSURE AND OF HYDROGEN ON THE PERFORMANCE OF A SOLID-INJECTION OIL ENGINE.

THE paper under above title, read by Mr. F. G. Mucklow before a joint meeting of the Royal Aeronautical Society and the Institution of Automobile Engineers on November 4, 1926, was one of very great interest in view of the developments now going on.

In his paper Mr. Mucklow dealt with experiments carried out in the engineering laboratories of the University of Manchester on a Crossley solid-injection oil engine in which small quantities of hydrogen or coal gas were introduced along with the air supply to the engine.

Three series of trials were run with hydrogen, each at a different load, namely, 53.4, 39.4, and 24.4 b.h.p. The maximum amount of hydrogen used was slightly more than 3 per cent. by volume of the air supply, corresponding, at the lightest load, to some 14 per cent. by weight of the oil fuel supply.

Three corresponding series of trials were run using coal gas in place of hydrogen, the maximum volume of gas employed being 5 per cent. of the air supply. At the lightest load, this corresponded to approximately 2.4 times the weight of fuel oil used.

The lecturer arrived at the conclusion that such quantities of hydrogen or coal gas could be used satisfactorily in the type of engine considered. No trouble was experienced due to pre-ignition or other causes, and the engine appeared to run more sweetly when gas was being used.

When running at constant load and speed, the admission of small quantities of gas appeared to cause combustion to take place at a slower rate, giving a lower maximum pressure and more burning down the expansion stroke. The thermal efficiency was in consequence slightly reduced, while the heat losses to exhaust were increased.

LIGHT 'PLANE CLUB DOINGS

London Aeroplane Club

THE total flying time for the week was 35 hrs. 15 mins. The following members had dual instruction: G. C. Bonner, T. C. Sharwood, F. Clarkson, G. H. Saxon Mills, E. J. B. King, Miss Fletcher, D. H. P. Esler, B. Lester, H. Spooner, M. P. Susman, H. Solomon, L. G. Sykes, Lady Bailey, H. H. Samuelson, E. E. Shaw, Miss O'Brien, A. J. Richardson, R. A. St. John, V. H. Doree, R. L. Preston, E. A. Lingard, W. J. S. McLeod, J. L. Gardner, E. S. Brough, G. H. B. Maddocks.

The following made solo flights: Lady Bailey, L. J. C. Mitchell, W. Hay, W. J. S. McLeod, E. S. Brough, Miss O'Brien, H. Petre, H. Kennedy, E. L. O. Baddeley, N. Jones, K. V. Wright, Sqdn.-Ldr. M. E. A. Wright, Maj. K. M. Beaumont, N. J. Hulbert, D. H. P. Esler, G. H. Craig, A. R. Ogston, G. Terrell.

The following members had joy-rides: E. H. Walker, W. E. P. Johnson, G. H. Craig, Miss Spooner, G. F. Wilson, Mrs. McKay, R. G. Gallien.

On Sunday, November 7, K. V. Wright passed the tests for his aviator's certificate. On Wednesday, November 3, R. L. Preston, about to start on a solo flight, taxied into a ditch, causing slight damage to G-EBNP.

The Hampshire Aeroplane Club

Report for week ending October 28:—Total flying time, 12 hrs. 26 mins.; instruction flying, 5 hrs. 40 mins.; passenger flying, 30 mins.; solo flying, 6 hrs. 16 mins.

The following members received instruction flights: Messrs. Southcliffe, 1 hr. 5 mins.; Bailey, 1 hr. 10 mins.; Lieut. Graham, R.N., 1 hr.; Miss Home, 45 mins.; Messrs. Bound, 30 mins.; Cooper, 25 mins.; Westbrook, 15 mins.; Bishop, 15 mins.; Moloney, 15 mins.

Mrs. C. B. Fry received 30 mins. joy-ride. The following members flew solo: Flying Officer Clarkson, 3 hrs. 55 mins.; Perfect, 53 mins.; Lieut. Musselwhite, 46 mins.; Lieut. Kennedy, R.N., 30 mins.; Mr. Fry, 12 mins.

Report for week ending November 4:—Total flying time for the week, 6 hrs. 25 mins. Instruction flying, 3 hrs.; passenger flying, 1 hr. 42 mins.; solo flying, 1 hr. 43 mins.

The following members received instruction: Messrs. Shepherd, 30 mins.; Bound, 25 mins.; Dickson, 25 mins.; Stokes, 25 mins.; Appleford, 20 mins.; Cooper, 15 mins.; Courtney, 15 mins.; Rumble, 10 mins.; Westbrook, 10 mins.

The following members received joy-rides: Miss Fry, Miss Manning, Capt. Lamplugh, and Mr. Stanford.

The soloists were: Messrs. Simmonds, 40 mins.; Perfect, 20 mins.; Fry, 18 mins.; Rumble, 10 mins.; Bowen, 5 mins.; and Flying Officer Clarkson, 10 mins.

Lancashire Aero Club

REPORT for week ending October 29:—Total flying time, 20 hrs. 5 mins., made up as follows:—

Dual with Messrs. Brown and Cantrill: Messrs. Blagden, 1 hr. 35 mins.; Hindley, 1 hr. 15 mins.; Abdalla, 1 hr. 10 mins.; Leigh and Costa, 1 hr. each; Twemlow and Gattrell, 50 mins. each; Anderson, 40 mins.; Shiers, 30 mins.; Barnes, 30 mins.; Whittaker, Cohen, Nelson, Dobson and Miss Brown, 20 mins. each; Miss Emery, 15 mins.; Mr. Michelsen, 15 mins.; Messrs. Goodyear and Hardy, 10 mins. each.

Solo: Messrs. Costa, 3 hrs. 20 mins.; Hardy, 30 mins.; Lacayo, 20 mins.; Agar, 20 mins.; Leeming, 10 mins.

Joy-rides with Messrs. Brown, Cantrill and Leeming, 1 hr. 30 mins. Tests, 1 hr. 30 mins.

The trades union spirit has been manifesting itself in the club during the past few weeks. Two flying members, who between them carry most of the joy-ride passengers on Sunday afternoons, have entirely different styles of pilotage. One likes to float about the atmosphere in a series of gentle cartwheels and half-rolls, ending up with a spinning nose-dive and a side-slip landing. The other (who has both a strong head and a strong stomach) is at his happiest when doing a vertical tail-slide stall, or stirring the porridge while on the top of a loop, both of which No. 1 pilot loathes. An agreement has therefore been concluded between them whereby any joy-riders asking for "fore-and-aft" stunts shall be handed over to No. 2 pilot, while all those requiring "lateral" stunts shall go with No. 1 pilot. One may add that a suggestion by the latter to the effect that "hoppity-hoppity" landings might appropriately be considered as "fore-and-aft" stunts was met with dignified silence.

Report for week ending November 6:—Total flying time, 21 hrs. 45 mins., made up as follows:—

Dual with Messrs. Brown, Cantrill, and Scholes: Messrs. Blagden, 1 hr. 55 mins.; Twemlow, 1 hr. 20 mins.; Cohen and Hindley, 1 hr. 5 mins.; Abdalla and Newton, 45 mins.; Dobson and Shiers, 40 mins.; Wood and

Miss Brown, 35 mins.; Hardy, 30 mins.; Moore, 25 mins.; Nelson, 25 mins.; Miss Emery, 25 mins.; Messrs. Crosthwaite and Anderson, 20 mins.; Goodyear, Dickinson, Powell and Forshaw, 15 mins.; Hardy, Lacayo, Pitman, Williams and Hargreaves, 10 mins.

Solo: Messrs. Michelson, 1 hr. 10 mins.; Costa, 45 mins. Agar, 25 mins. Williams, 15 mins.

Joy-rides.—With Mr. Leeming: Messrs. Colwell, 30 mins.; Swindells 15 mins. With Mr. Lacayo: Messrs. Benson, 1 hr. 35 mins.; Hartley, 30 mins.; Sivery, 30 mins.; Nelson, 20 mins. With Mr. Williams: Mr. Cantrill, 10 mins. Tests, 1 hr. 30 mins.

The weather has been normal throughout, with gales, rain, and fog predominating in turn.

Midland Aero Club, Ltd.

REPORT for week ending November 6.—Owing to very bad weather flying was only possible on three days. Total flying time, 4 hrs. 5 mins.

The following members were given dual instruction: J. Brinton, C. Fellows. The following members made solo flights: G. V. Perry, J. Brinton, E. J. Brighton.

Newcastle-upon-Tyne Aero Club

MR. PARKINSON is still enjoying his rest from flying by spending his time at the aerodrome superintending the flying of members of the club.

It is not yet decided who shall take him up for "a few landings" on the completion of his four weeks on the ground, but no doubt the matter will have to be considered shortly. There should be a good attendance of members who only fly occasionally to witness this event.

The total flying time for the week ending November 7 was 14 hrs. 40 min. 4 hrs. 45 mins. of this being flown on Sunday.

The following members flew solo and with passengers: Lord Ossulston with Miss Leathart, Mr. Wardill and Mr. Mathews; Mr. N. S. Todd with Mr. Stewart, Mr. Bruce and Mr. Turnbull.

Mr. Irving put in a lot of solo flying, and will carry out the tests for his licence as soon as weather conditions permit of the height tests. Mr. Mathews has also flown frequently alone.

Dr. Dixon flew with Mrs. Marcks and Mr. Phillips. Mr. Phillips took charge of the machine on some occasions. As these members always fly together, it is seldom certain who is actually the pilot.

Mr. Heppell flew with Mr. Kennedy as passenger. Mr. Kennedy also flew with Mr. Ellis. Mr. C. Thompson took up Mr. Osborne and Mr. Thompson.

Mr. H. Ellis completed his tests on November 1. It was a very clear but cold day, and Mr. Ellis flew well and his judgment for landings, etc., was excellent.

Yorkshire Aeroplane Club, Ltd.

REPORT for the week ending November 5.—Total flying time 7 hrs. 55 mins., as follows:—

Solo flying, 1 hr. 30 mins.; dual instruction, 6 hrs. 5 mins.; and joy rides, 20 mins. Flying was only possible on three days out of the week, 24 flights being accomplished in all.

The following members flew solo: Messrs. Dawson, L. S. Wood, Lax and Watson. The following were given dual instruction: Messrs. Batecock, Brown, Dawson, L. S. Gratwick, Harvey, Mann, Oglesby, Watson, Wilson, Captain Beaumont and Miss Woodhead.

In spite of the weather conditions Messrs. Watson and Dawson were launched solo during the week. Both put up a very good show, and should develop into really useful pilots. Miss Woodhead and Mr. Mann will shortly be launched.

Mr. Rimmer has now left us, the more hurriedly because Captain West took him up on "LS" on Saturday and suffered a forced landing with a choked jet. Mr. Rimmer, a little distraught, got out of the machine, went back to the aerodrome, flew away in his Avro, and has not been seen since.

Mr. Wood has done one loop. The significance of this lies in the fact that he did not, as hitherto, inadvertently perform a second loop while pulling out of the first.

We wish to offer our most hearty congratulations and good wishes to Messrs. Stack and Leete of the Lancashire Club on the very difficult and sporting trip that they are taking on. We are particularly interested in this venture as we realise we are supplying equipment for the trip to the extent of one wheel and one cylinder head, which the most urgent personal appeals have failed to produce at Sherburn. However, the thought that our wheel should be well on the way to Karachi reconciles us to the sight of G-EBNN resting in a corner of the hangar with chocks delicately arranged below the axle.

May the seatings stick to the head and the spokes to the rim, and the very best of luck go with them both!

SURVEYING BY AEROPLANE

AIR survey and its importance to the development of the Empire was the *raison d'être* of a small gathering at the Holborn Restaurant on November 4, the hosts being the directors of Air Survey, Ltd. Col. C. H. D. Ryder, C.B., C.I.E., D.S.O., the chairman of the company and a former Surveyor-General of India, presided.

Col. Ryder in his opening remarks said the whole world had suddenly roused itself—the man in the street, who was, after all, the average citizen, had been stirred by the wonderful flight to Australia and back by Sir Alan Cobham. It was now up to them, the Dominion and other Governments, to take advantage of this, and thereby bring the whole world nearer together and increase more rapidly the untold wealth of its unexplored regions.

In the last few years, with the exception of the Canadian Government, the Air Survey Company, with their numerous successful surveys in the East, had done more, he said, than anyone to further and popularise air survey. But very much more remained to be done. If we wished the British Empire to maintain a supremacy in the air, we must educate the public to the undoubted uses of the aero- and sea-planes.

He claimed to speak with some authority on the matter of surveying, having been a surveyor and explorer all his active life, including five years as head of the survey of India, and he was convinced that surveying from the air had come to stay. In this respect we could use a good slogan: "Half the cost in one-quarter of the time." There were vast tracts of lands, undoubtedly of enormous value, still unmapped, and most assuredly no country could be developed without maps, as they were the very first requirement. Only last week he received a letter from a friend in Canada, in which he said:—

"A larger programme in aerial photography than ever before has been completed. Surveyors, foresters, water power engineers, geologists and, in fact, almost every branch of engineering work interested in the development of this country are now backing aerial surveys as being the fastest and best method of obtaining information on which their work depends."

Continuing, he said, he had spoken upon air survey alone, but there was another development which must come and that was air mail and transport, and he wanted to emphasize that air survey and air transport were as inseparable as Siamese twins. They were now centering their attention upon the air mail and transport side of the question, and felt that they might be up against big odds, but if only companies holding large concessions of lands, big merchant traders, and last—the most important—the various Governments, would come to their aid and assistance, then within the next few years the expansion in trade and commerce by the means of the air would become an epoch in the era of our history.

In conclusion, the chairman congratulated and thanked the staff for the splendid work they had done, especially Mr. F. P. Raynham, who had just returned from Borneo after completing two large surveys and who was there today and had joined the board of directors, and Capt. J. Durward, who was now carrying on the good work in the East.

Mr. R. C. Kemp, managing director of Air Survey Co., Ltd., in dealing with what he termed the more neglected branch of aviation, namely, survey by photography from the air, mentioned the survey of the Irrawaddy Delta (1,400 square miles) which saved the Government of Burma an expenditure of £18,000 and three to four years in time, according to an estimate of a Government surveyor. Since 1924 the Air Survey Company had surveyed the South Tenasserim Forests in Burma.

The country had previously been mapped by the survey of India on a scale of 1 in. to the mile, so that all that was required by the forest department was a very complete reconnaissance during which the various forest types were located and their position marked on the maps by trained forest officers, who flew as observers on the company's seaplanes. In order that the results of their reconnaissance might be confirmed, numerous strips of oblique and vertical photographs were run over the area at convenient intervals, from which a more detailed and prolonged study could be made than was possible from the air.

The area covered was approximately 15,000 square miles, and took only three months' flying from four different bases along the Tenasserim coast. For the first time it has been possible to locate where the Nomad cultivators, who "move on" to new ground each season, had burned and cleared fresh jungle as they go, as well as the deserted clearings now in a state of secondary jungle, so that the tremendous extent

of forest distraction from this cause could be estimated and steps taken to get it under control.

In the same season the Burma oilfields at Yenangyaung were photographed and rectified prints on a scale of 24 in. to the mile were supplied to the Survey of India for the amplification of detail on the map which they were supplying to the Burma Oil Co.

In 1925 a complete survey party was taken down to Borneo, when 1,400 square miles in the Baram district of Sarawak and Brunei were surveyed in seven months against heavy odds in the form of abominable photographic weather. In Burma, in the fine season, a similar area could have been completed in two or three months. That contract, with its heartbreaking delays and difficulties, taught them much, with the result that, on their next survey, some 2,300 square miles in the Rejang district of Sarawak, under Mr. Raynham's charge, he and his assistant, Mr. Andrews, were able to devise a system which simplified the work and, at the same time, largely overcame the cloud difficulties.

They were now employed by the Federated Malay States on the Survey of the Mangrove forests on their West coast, in addition to one or two smaller contracts for engineers and others. Their next move would be to Bengal, where they would make their first start on air survey in India. Mr. Kemp then detailed the several different purposes for which their surveys had been made, including for forest purposes, town planning, etc.

In addition to these, they were convinced of the utility of air survey on river training, hydrographical surveys on rocky or shoal coasts and rivers, prospecting, railroad and engineering surveys, including hydro-electric and water power, and lastly, all kinds of revenue surveys. He would say that it should not be thought for one moment that air survey was going to supersede entirely the older method and put the surveyor out of business. They could not get on without the ground surveyor, who would, however, have to employ the air methods to increase the scope of his work and keep pace with the demand for developments in new countries, as well as revision of his work in countries already mapped.

The farthestmost of their surveys were separated by 3,000 miles or more, as the seaplane flies, and their seaplanes had now operated along the whole of the coast from Rangoon to Singapore, Singapore to Pontianok in Dutch Borneo, via the Dutch Islands of Muntok, and Tangong, Pandang, and from Pontianok to Jesselton in British North Borneo. From the experience gained they had come to the conclusion that air survey and air transport could be best conducted together, especially abroad, for although survey parties operating in the East were to some extent based on London, from where they must draw their supplies, they should also have some form of Eastern depot where overhauls could be continuously carried out, a heavy charge to be borne by the survey parties. Therefore, stores, workshops, personnel, and, in fact, all the facilities at a transport company's main base, could be shared by both survey and transport and the cost divided between them. Their company had decided to go ahead on these lines on a route which had been chosen, partly for its commercial attractions and partly on account of its favourable weather conditions.

Designs for an eight-seater seaplane, with several of which it is proposed to make a start, were well in hand and showed excellent promise. After a period of say 18 months or two years, when it was likely a larger machine would be required, it was estimated that local traffic and survey or reconnaissance would supply ample demand for the older type, so that there would be no necessity to scrap them.

The postal authorities abroad were apparently anxious and eager for the development of mail-carrying air services, as was evidenced by the interest they had taken of late in the flights by Mr. Raynham and Mr. Vincent of this company, who carried respectively the first air mail in Sarawak, from Borneo to Singapore, also from Singapore to Port Swettenham and Kuala Lumpur.

The Secretary of State for Air, in speaking to the Members of the Imperial Economic Conference on bettering our Empire communications by air services, said: "As to safety, what better record could there be than the five million miles flown by British Services for four fatal accidents, and the million miles flown in Australia for a single accident?"

Their company, in a small way, could add to that an interesting record as they had not had a single fatal accident during the operation over 90,000 miles of three seaplanes for three years over coast lines and rivers, without any ground organisation other than that which could be readily improvised

by their working parties in a part of the world where aircraft were in most cases, strange to the inhabitants, and which was shortly, they hoped, to be part of the route of one of the midway links between England and Australia.

It was the three years during which this mileage had been covered without a single accident that told, and the people among whom they had worked in the East now expected this reliability from aircraft, whoever they be operated by, a most hopeful sign for the future of commercial airways.

Col. Edwards, C.M.G., who spoke in the unavoidable absence of Sir Sefton Brancker, said the gathering marked a new stage in aerial development, it being the first luncheon to celebrate Air Survey pure and simple, proving that it had got through its teething stage and was well on to adolescence. He believed the air could solve their difficulties of colonisation. In Canada, Australia and our other Colonies it must be realised there were vast regions entirely unsurveyed and unmapped, to which *all* classes—professional or otherwise—*must* have access. The Company had surveyed 600,000 square miles, and made a reconnaissance of 14,000 square miles, and Sir John Eaglesome, the engineer, had told him that had our early engineers only had air services, what vast expenses and time might have been saved in unknown territories. In regard to communications by air, at present we thought in time, not distance—the only thing that mattered and the only thing that brought about time saving was air transport. The amenities of civilisation were thereby brought to the backblocks of our Colonies, rendering life absolutely different in those districts. Col. Edwards instanced the Northern part of Central Australia, which was without any means of communication, consequently, with no womenfolk there, without whom colonisation could not go on. Again, air transport enabled them to get medical aid to those parts in reasonable time, rendering it possible for people to live in those areas who would never otherwise have gone there. In conclusion, he said, infinitely more people had been saved by civil aviation than had ever been killed by aviation.

Lieut.-Colonel J. T. C. Moore-Brabazon, Parliamentary Secretary, Ministry of Transport, said that eight years ago he considered himself one of the greatest experts upon aviation alive, and yet now none here was more profoundly ignorant upon the subject than himself. The Air Survey Co. required, he thought, all the encouragement it could get. When anyone introduced a new thing it was only under the most urgent pressure that the man in the street would support it. By way of instance, he recounted some of the difficulties that had to be overcome by the Air Force in the early days of the war. "Anybody," he said, "might have imagined that photographs of the enemy line of trenches would have been a welcome contribution to the General Staff when an attack was contemplated. But we could not get the staff

to accept our photographs, and it was not until General Brancker became a sort of peripatetic picture postcard seller that any impression was made. After the photographs were accepted nobody ever thought of making a map of the enemy lines, and the Royal Flying Corps did a most irregular thing in making maps themselves. I did that, and I was nearly shot at dawn because it was not in the book. Later on the same thing occurred with regard to the interpretation of photographs. There were many things there which one could read if one had experience. The Flying Corps published a book on the interpretation of aerial photographs, and there was another row because that was the business of Intelligence, G.H.Q. That shows the difficulty of introducing a new thing. You who are engaged on aerial survey have got a good thing which you are trying to give to the Governments of the Empire, and although you are not paying a dividend, it is pleasant to see that you are not going into bankruptcy."

Sir Alan Cobham emphasised that aerial survey and transport would be a huge benefit to the country, and it was up to the Governments of the countries concerned to see that this company was adequately supported. That would be no philanthropic move when it was realised that the opening up of the countries by that means would enormously increase the values of the districts served by these air lines, paying the countries 10 times over. But it was necessary to influence public opinion to appreciate that.

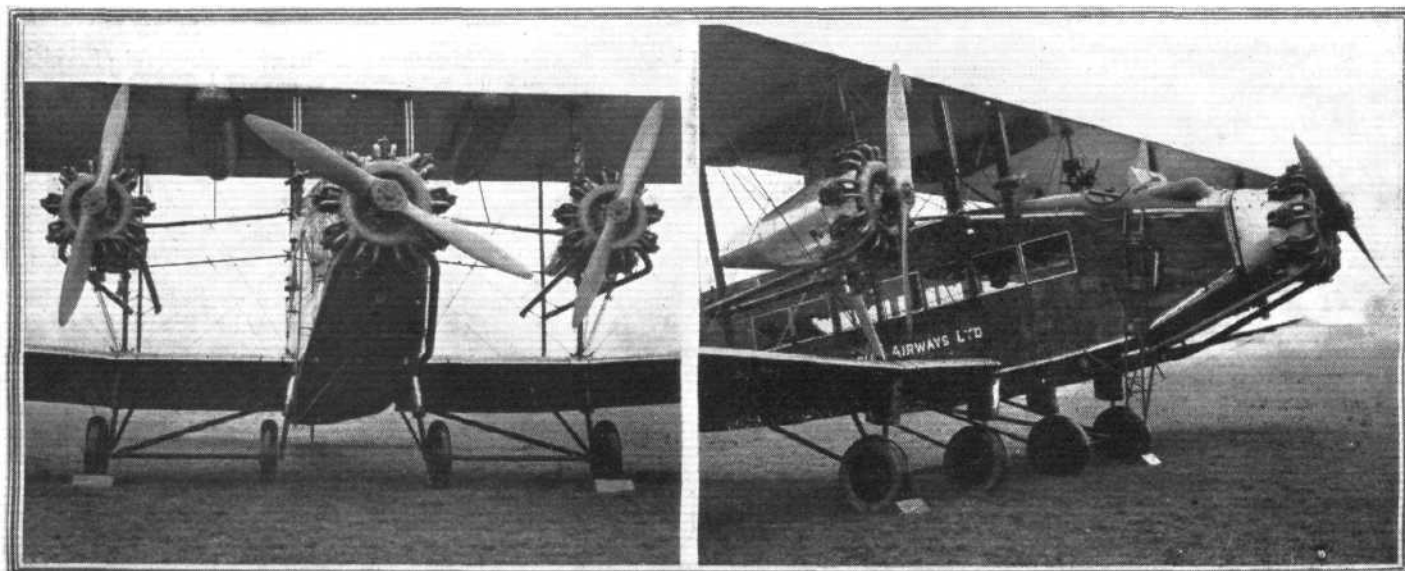
General J. H. McBrien (Chief of the Canadian General Staff) mentioned that in Canada considerable progress had been made on both the commercial and military sides of aviation. Through the co-operation of the old ground survey system and the newer aerial methods they were surveying at the rate of about 50,000 square miles a year in Canada. From the military point of view, they were well advanced, and they used British equipment as far as possible in all their aerial work. His Government were anxious in every way to work with Britain in developing this great air work for the general benefit of the Empire.

Amongst the invited guests, besides those already mentioned, were The Hon. M. W. Elphinstone, Sir Francis MacLean, Captain F. Tymms (Air Ministry), Flight-Lieut. H. Edwards (Canadian Liaison Officer), Mr. F. D. Thomson (Secretary, Prime Minister's Department, New Zealand), the Hon. W. J. Higgins, K.C. (Minister of Justice, Newfoundland), the Hon. A. B. Morine, K.C. (Newfoundland), Major C. G. Lewis (Survey of India), Mr. H. Wyndham Jones, Dr. Charles Hose (Council, Government of Sarawak), Mr. J. F. Hunter, Mr. C. Morrell, Mr. H. O. Short, Mr. C. R. Faurey, Mr. Campbell Hart, Mr. Hugh D. P. Francis, the Hon. A. G. Bell, Mr. Laurence Pritchard, Mr. F. P. Raynham, Mr. W. P. Kemp, Mr. J. W. L. Kemp, and Mr. C. Acton Dodds.

New Ulster Air Squadron Headquarters

THE new city headquarters of the Ulster Air (Bombing) Squadron at Donegall Square South were opened on October 30 by the Duke of Abercorn. The squadron, which is for home

defence, is stationed at Aldergrove, and at full strength numbers some thirty officers and two hundred men. It will be under the command of Wing-Commander A. C. Wright, A.F.C.



THE "HAMPSTEAD'S" NEW POWER PLANT: Two views of the three-engined Handley-Page "Hampstead" airliner, for Imperial Airways, fitted with three Bristol "Jupiter" Series VI engines.

THE "EAGLE" AERIAL CAMERA

A New British Electrically Operated Outfit

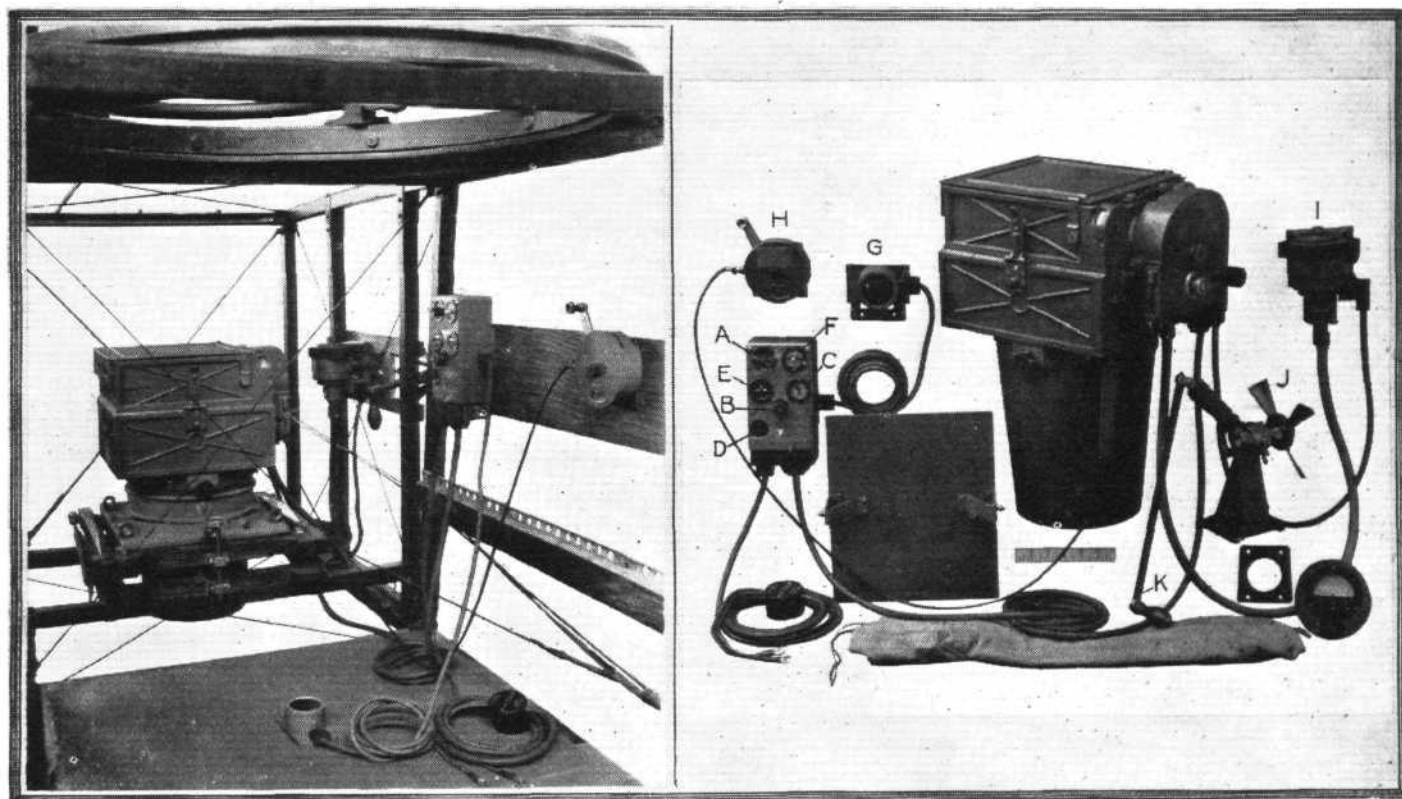
DURING the last few years remarkable progress has been made in aerial photography, not only as regards its ever-increasing use in all parts of the world, but also in respect to the improvement that has been accomplished in the technical side of aerial photography.

Last week we had the opportunity of inspecting one of the latest developments in aerial cameras, which was demonstrated by the Aircraft Operating Company, at the exhibition of Aerial Survey Work arranged by this company for the delegates to the Dominion Conference. The camera in question is the "Eagle," designed and manufactured by the well-known firm of camera makers, the Williamson Manufacturing Co., Ltd., of Willesden Green, N.W. 10, the sole selling agents for which are Vickers, Ltd., of Vickers House, Broadway, S.W. 1. It may be mentioned here that this apparatus will be used by the Aircraft Operating Company for the air survey contract which they are about to carry out in Northern Rhodesia.

The "Eagle" is designed primarily for air survey photography, and is entirely automatic, being operated and controlled electrically; it can, however, if necessary, be operated

The body of the camera, which carries the lens cone, gear-box, instrument box, focal plane shutter and magazine, is made entirely of aluminium, and is provided with various clips and supports for attaching the different units thereto. A recess is provided in the top of the body to accommodate the film register plate, which is of specially selected glass provided with the necessary collimating points. The film magazine is also made of aluminium, and is attached by spring clips to the camera body. Several spare loaded magazines can be carried in the aeroplane, and can be attached whilst in flight. A separate compartment in the magazine contains the gearing, a counter indicating the number of exposures made, and an indicator which shows at a glance when the film and magazine are functioning correctly. The frame carrying the film spools is provided with a pressure pad, mechanically operated when the film is stationary to hold the film flat in the focal plane at the moment of exposure.

The lens cone is adapted to take any lens from 7 in. to 20 in. focal length, and the focal plane shutter is set to,



THE "EAGLE" AERIAL CAMERA: Two views of the latest British aero camera, which is controlled and operated electrically. On the left, as installed in an aeroplane; right, the principal component parts, reference to which is made in the text.

by mechanical control or by hand, and the operator can change over from one to the other with the greatest of ease and security. It will take single views, mosaics, oblique or stereoscopic views, and with a single loading of the camera 100 exposures can be made at exactly the right interval of time, so that the consecutive pictures match correctly to form the continuous strip map extending over a distance of from 100 to 500 miles.

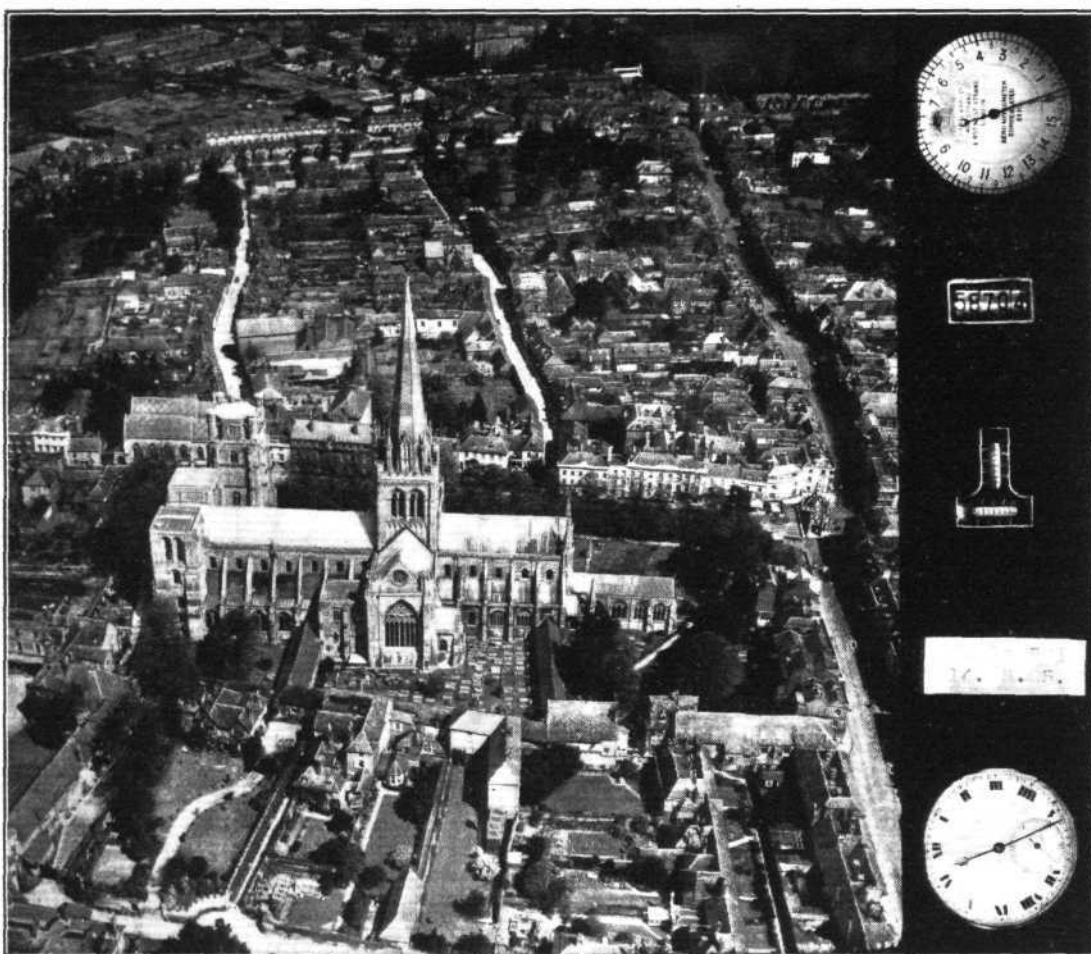
On every photograph is recorded the exact hour, minute and second of exposure, the height at which the aeroplane was flying, the angle of inclination to the ground beneath, a serial number, the scale, type of aeroplane used, date, etc. This camera employs panchromatic film, and takes pictures measuring 7 by 7 in.; each film is 9 in. wide and 65 ft. long, or sufficient for the 100 exposures.

Having thus briefly outlined the main features of the "Eagle" camera, we will now deal with its construction and operation, with the help of the accompanying illustration, which shows the complete outfit as installed in a machine, and the principal component parts.

give an exposure of $1/90$ th of a second; the standard lenses supplied have an aperture of F.4.5, variations of exposure being made by means of an Iris diaphragm. The actinic value of the exposure at "open" aperture is ample for a good negative on a day of low light value.

This camera, when equipped for electrical control, is entirely automatic, the only work falling to the operator being to switch on the remote control ("A" in the illustration) on the electrical control unit, which is mounted in the pilot's or observer's cockpit, and gives entire control of the operations wherever the camera may be fixed. This unit consists of a small oblong box connected to the camera and the controls by three separate electric leads. On this box are four dials, a knob, and a push button. One dial is the switch "A," referred to above, which sets the apparatus in motion, causing photographs automatically to be taken at a predetermined interval which is controlled by the knob "B," a dial "C" indicating the period and the number of seconds to pass before the exposure is to be made. When it is required to make a single exposure during the period between

The "Eagle"
Aerial Camera :
An example of an
Oblique photo-
graph taken with
the "Eagle"
Electric camera.
Recorded on the
right of each
exposure made
is such informa-
tion necessary in
the making of
air maps—time,
altitude, inclina-
tion, etc.



the automatic period, it is only necessary to push the button "D" when the dial "E" indicates that the shutter is set. The fourth dial "F" indicates the total number of exposures made with each magazine, while a small red lamp "G" automatically flashes a signal five seconds before an exposure is made, thus enabling the pilot to keep the machine steady at the moment of exposure.

Power for the operation of the camera is obtained from an electric motor, "I," driven from a 12-volt supply source, and driving the camera gear-box through a detachable flexible drive. As a protective measure a friction clutch is inserted between the armature spindle and the driving dog for the flexible shaft, which is so adjusted as to transmit sufficient power to drive the camera under normal conditions, but will slip in the event of a jam in the magazine gear-box.

The gear-box is an aluminium casting attached by means of a hinge and thumb-screw to the side of the camera body. It contains the various mechanical and electrical devices for changing the film, setting the shutter, controlling the counters, set-indicator and motor, and also carries the turning handle for manual operation.

Should the electric current fail, or not be available, an alternative power device is provided. This consists of a "windmill" "J" in the slipstream of the airscrew, which takes the place of the electric motor. In this case the camera is semi-automatic, the exposures being made by hand, using the Bowden control "H." The "windmill" is thrown out of action, when not in use, by the lever "K."

If required, the camera can be entirely operated by hand, in which case it is necessary to turn the handle provided for this purpose on the gear-box.

The instruments for recording the various data on the

negative are contained in a box, forming a complete and separate unit, which can be removed through a door in the side of the camera body. It contains the following:—Veeder Counter, aneroid, two-way spirit level, thirty-hour watch, Ivoryne tablet, on which may be recorded camera number, focal length, date, etc., etc. A small 1-in. f/3.5 lens is mounted above each instrument, which is illuminated, for recording the image on the film. We note, however, that while most of the information likely to be of assistance for surveying or map-making is thus recorded on each photograph, there is no provision for indicating the points of the compass—an item which is not, perhaps, absolutely necessary, but which should certainly be useful. Of course, in some cases the shadows cast on the ground, taken in conjunction with the time, would afford sufficient indication of the direction of "north."

The method of supporting the camera in the aeroplane is worthy of special note. Various adjustments are provided, so that the camera may be set at any desired angle to correct the changing position of the aeroplane to the horizontal while the camera may be rotated in its supports to allow for drift.

The weight of the "Eagle" camera, complete with cone and lens, varies from 41 lb. to 51 lb., according to the size of lens fitted, while the other components weigh about 40 lb.; spare magazines, with 100-exposure film, weigh 14 lb. each. The price of this camera is, we understand, £350.

A number of these cameras are already in use by the Royal Air Force (known as the Service Type F/8), and the Aircraft Operating Co. used the actual camera demonstrated last week on the revision work which they carried out for the Ordnance Survey.

PERSONALS

Married

The marriage of Mr. J. E. L. HUNTER (late R.N.A.S.), only son of Mr. and Mrs. E. L. Hunter, of Shanghai, and Mrs. GWENDOLEN MARY CLEATON MULOCK, only daughter of the late Mr. and Mrs. Cleaton, took place quietly in London on November 6.

To be Married

The engagement is announced between Maj. EUAN J. L. W. GILCHRIST, M.C., D.F.C., of Salisbury, Rhodesia, son of Mr. and Mrs. William Gilchrist, of St. James, South Africa, and

ROSEMARY, daughter of Mr. and Mrs. SEALY-ALLIN, Rhodesia (late of Youghal, Co. Cork), and granddaughter of the late Col. T. Goddard, of Colne, Wilts.

Item

The will of the late Flight-Lieut. REGINALD CAREY BRENTON BRADING, R.A.F., D.F.C., of Outram Road, Croydon, who brought down 32 enemy aeroplanes during the war, and who was killed in an aeroplane accident near Baghdad on July 26, has been proved at £8,809.

THE ROYAL AIR FORCE

London Gazette, November 2, 1926

General Duties Branch

The following are granted permanent commns. in the ranks stated:—
Flight-Lieut. C. R. Carr, D.F.C.; Nov. 1. Flying Officer E. M. Drummond (Lieut., Half Pay List, Army); Oct. 20. Pilot Officer J. S. Blomfield is promoted to rank of Flying Officer; Oct. 14. Air Vice-Marshal Sir O. Swann, K.C.B., C.B.E., is placed on half-pay, scale A; Nov. 2. Flying Officer A. E. Connolly is transd. to Stores Branch on probation; Oct. 25. Flight-Lieut. A. Chapman is placed on retired list; Nov. 1. Flying Officer A. Neeson is placed on retired list at his own request; Nov. 3. Flight-Lieut. D. S. Jellings, M.C., is granted permission to retain rank of Sqdn. Leader on retirement; Oct. 1.

The following are transd. to the Reserve:—

Class A.—Flight-Lieut. A. E. Woodbridge; Nov. 1.
Flying Officers: F. Beesley; Nov. 2. J. F. Bythell; Nov. 2. W. E. Cowan; Nov. 3. O. J. F. Jones-Lloyd; Nov. 5.

Class B.—Flight-Lieut. J. M. McEntegart; Oct. 24.

The following Flight-Lieuts. are transd. to the Reserve, Class A; Oct. 24 (substituted for the notification in the Gazette of Oct. 26):—W. Halford, D.F.C., S. H. Potter, R. J. Read.

Flying Officer H. E. F. Saunders is transd. to Reserve, Class C; Sept. 12 (substituted for Gazette, Sept. 17); Flying Officer L. W. Mercer (Lieut., R.A.), relinquishes his temp. commn. on return to Army duty; Oct. 20. Pilot Officer P. N. Garthwaite relinquishes his short service commn. on account of ill-health; Nov. 3.

Medical Branch

Temp. Lieut. V. G. Pedley, General List (Army), Dental Surgeon, is granted a temp. commn. as a Flying Officer on attachment to R.A.F.; Oct. 18. He will continue to receive emoluments from Army sources; Flying Officer G. J. Hanly, M.B., is promoted to rank of Flight-Lieut.; Oct. 23.

Chaplains Branch

The Rev. W. P. Hughes is granted a short service commn., with the relative rank of Sqdn. Leader; Oct. 29.

Memoranda

Sec. Lieut. J. L. Rodrigues is deprived of permission to retain his rank on conviction by the Civil Power; Oct. 1.

Reserve of Air Force Officers.

A. B. Roche is granted commn. in Class B, General Duties Branch, as Flying Officer, with effect from Aug. 31, and with seniority of Feb. 4; E. K.

Rayson is granted commn. in Class A.A., General Duties Branch, as a Pilot Officer on probation (Sept. 13); Pilot Officer D. S. Purnell is confirmed in rank (Oct. 26); Flying Officer H. P. L. Gardner is transferred from Class A to Class C (Oct. 23).

The following relinquish their commns. on completion of service:—Flying Officer K. L. Graham, Flying Officer C. T. Robinson (May 29); Flying Officer G. Burton (June 19); Flight-Lieut. W. A. Malone (July 13); Flying Officer H. St. C. Roy, M.C. (July 26); Flying Officer C. P. Murchie (Aug. 2); Flying Officer I. R. Taylor (Aug. 14); Squadron-Leader C. E. C. Rabagliati, M.C., A.F.C., Flying Officer L. G. Harrison (Sept. 4); Flying Officer F. J. H. Ayscough (Sept. 12); Flying Officer F. W. Martyn (Oct. 10); Flight-Lieut. A. D. Newbury, Flight-Lieut. L. Whitworth, A.F.C., Flying Officer G. Baillie, Flying Officer E. A. J. Brown, Flying Officer K. C. L. Gorrage, Flying Officer J. D. Jackson, Flying Officer, G. Kidd, Flying Officer L. J. Lipscomb, Flight-Lieut. L. H. Pakenham-Walsh, Flying Officer A. J. Packhan, Flying Officer A. W. S. Wagner (Oct. 24).

The commn. of Pilot Officer on probation A. B. Roche in Class A.A. is terminated on cessation of duty (Aug. 31).

Reserve of Air Force Officers

F. J. Wright is granted a commn. in Class A.A., General Duties Branch, as a Pilot Officer on probation; Oct. 18. Pilot Officer on probation D. P. Jones is confirmed in rank; Oct. 27. The following Flying Officers are transd. from Class A to Class C:—H. Jones; July 14. G. F. Blackburn; Nov. 2.

The following relinquish their commns. on completion of service:—Flying Officer M. B. Lacey; June 26. Flight-Lieut. H. V. Worrall, D.S.C., Flying Officer R. W. Warner, Flying Officer J. S. G. Wrathall; Sept. 12. Flying Officer J. R. Stafford-Langan, D.F.C.; Oct. 15. Flying Officer W. Halliwell, Flying Officer A. J. H. Taylor; Oct. 24. Flying Officer H. W. Prockter relinquishes his commn. on completion of service and is permitted to retain rank of Flight-Lieut.; Sept. 16. Flying Officer J. S. Hughes relinquishes his commn. on account of ill-health, and is permitted to retain his rank; Nov. 3. Flying Officer J. M. Leach resigns his commn. on appointment in the Auxiliary Air Force; Nov. 2.

Auxiliary Air Force

General Duties Branch

The following to be Flying Officer:—No. 605 County of Warwick (Bombing) Sqdn.—J. M. Leach; Nov. 2.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch.

Wing-Commander E. R. Manning, D.S.O., M.C., to School of Naval Co-operation, Lee-on-Solent, to command; 1.11.26.

Squadron-Leader J. C. P. Wood, to H.Q., Egypt; 21.10.26.

Flight Lieutenants: F. O. Soden, D.F.C., to No. 605 Sqdn., Castle Bromwich; 5.10.26. H. A. J. Wilson, O.B.E., to R.A.F. Depot, Uxbridge, on transfer to Home Estab.; 1.11.26. C. Bompfrey, D.F.C., to R.A.F. Base, Malta; 15.10.26. N. P. Dixon A.F.C. to H.Q., Egypt; 8.10.26. N. H. Jenkins, O.B.E., D.F.C., D.S.M., to No. 15 Sqdn., Martlesham Heath, on transfer, to Home Estab.; 15.11.26. S. E. Storrar, to No. 1 Flying Training Sch., Netheravon, on transfer to Home Estab.; 7.11.26. A. J. Warwick, to No. 32 Sqdn., Kenley; 2.11.26. C. J. Sims, D.F.C., to Sch. of Photography, Farnborough; 27.10.26. S. E. Toomer, D.F.C., and R. M. Foster, D.F.C., to H.Q., Iraq; 20.10.26. M. Ballard, to R.A.F. Depot, Uxbridge, on transfer to Home Estab.; 10.10.26. N. L. Desoer, to Armament and Gunnery Sch., Eastchurch; 8.11.26.

Flying Officers: E. B. Forster, to Stores Depot, Iraq; 2.10.26. G. L. Gandy, to Inland Water Transport, Iraq; 28.9.26. F. G. Jennings, to R.A.F. Depot, Uxbridge, on transfer to Home Estab.; 7.11.26. L. S. Potter, to H.Q., Iraq; 9.10.26. E. A. Sullock, A.F.C., to No. 5 Flying Training Sch., Sealand; 3.11.26. E. M. Drummond, to R.A.F. Depot, Uxbridge, on appointment to a Permanent Commn.; 20.10.26. F. H. Cashmore, to Home Aircraft Depot, Henlow; 1.11.26. W. W. Bradford, to H.Q., Coastal Area; 1.11.26. L. K. Barnes, to School of Naval Co-operation, Lee-on-Solent; 21.9.26.

Flight Lieutenants: F. Thomasson, D.F.C., M.M., to Reception Depot, West Drayton; 1.11.26. E. H. Richardson, to No. 10 Group H.Q., Lee-on-Solent, 20.10.26; F. H. Isaac, D.F.C., to H.Q., Wessex Bombing Area, Andover, 2.11.26; R. L. McK. Barbour, D.F.C., to Experimental Section, R.A.F., Farnborough, 28.10.26.

ROYAL AERONAUTICAL SOCIETY (Official Notices)

Students' Section

Mr. F. Handley Page, C.B.E., Fellow, will address the students on "The Future of Aviation," at their inaugural meeting of the present session. The meeting, to which visitors are invited, will take place in the Society's Library at 7, Albemarle Street, to-day (November 11) at 7 p.m. The chair will be taken by Lieut.-Col. I. A. E. Edwards, C.M.G.

Pilcher Prize.—The Pilcher prize for the best paper submitted by a student to inaugurate discussion at a Students' meeting has been awarded to a paper on "Experimental Flying from the Pilot's Point of View," by Flying-Officer R. Linton Ragg. To this prize has been added a cash prize, kindly given by Lieut. R. V. de Aboim, of the Brazilian Navy, an Associate Fellow of the Society. The two prizes will be presented at the Students' meeting on November 11.

Lecture.—The fourth lecture of the first half of the sixty-second session will be held on November 18 at 6.30 p.m. at the Royal Society of Arts, 18, John Street, Adelphi, W.C. 2, where Mr. R. S. Capon will read a paper entitled "Methods of Performance Testing and Analysis." Air Vice-Marshal Sir

Flying Officers: E. M. Drummond, to No. 100 Sqdn., Spittlegate, 3.11.26. J. F. F. Pain, to No. 16 Sqdn., Old Sarum, 9.11.26.

Flying Officers: A. H. C. A. Rawson, to R.A.F. Cadet College, Cranwell, 2.11.26; G. E. Nicholls, to R.A.F. Station, Donibristle, on transfer to Home Estab., 17.10.26; F. T. Stacey, to R.A.F. Depot, on transfer to Home Estab., 17.10.26; F. W. M. Matthews, to Armament and Gunnery Sch., Eastchurch, 21.10.26; G. H. Huxham, to No. 208 Sqdn., Egypt, 20.10.26; H. A. Anson, to No. 32 Sqdn., Kenley, on transfer to Home Estab., 13.11.26; B. J. J. Nimmo, to No. 2 Armoured Car Co., and Repair Section, Palestine, 1.10.26; C. G. H. E. Lumsden, to No. 43 Sqdn., Henlow, 12.11.26; H. E. N. Burton and R. W. Holden, to No. 24 Sqdn., Kenley, 1.11.26.

Pilot Officers: J. L. Adams, J. F. Dowdeswell, and R. H. Winn, to No. 9 Sqdn., Manston, 9.11.26; C. A. Anderson, L. G. Gray, F. J. Parker, and L. C. Phillips to No. 13 Sqdn., Andover, 9.11.26; R. Benham, to No. 207 Sqdn., Eastchurch, 9.11.26; T. B. Byrne, H. J. J. Mumford-Mathews, E. G. C. Stokes, and E. L. Wilson, to No. 2 Sqdn., Manston, 9.11.26; D. V. Ivins, to No. 16 Sqdn., Old Sarum, 9.11.26; R. O. O. Taylor, to No. 58 Sqdn., Worthy Down, 9.11.26; W. G. Woolliams, to No. 39 Sqdn., Spittlegate, 9.11.26.

Pilot Officers: H. A. S. Byrne, to No. 30 Sqdn., Iraq, 1.10.26; H. V. Crowder, F. G. H. Ewens, and W. J. M. Spaight, to No. 70 Sqdn., Iraq, 1.10.26; A. P. Wayte, to Heliopolis Details, Egypt, 20.10.26.

Stores Branch.

Pilot Officer: P. H. Wilcox, to H.Q., Cranwell, on appointment to a Permanent Commission (on probation), 30.10.26.

Accountant Branch.

Flight Lieutenant J. Sullivan, to H.Q., Egypt, 1.10.26.
Flying Officers: S. W. Hill, to H.Q., Cranwell, 8.11.26; R. W. Freeman, to No. 4 Flying Training School, Egypt, 20.10.26.

Medical Branch.

Flight Lieutenant T. J. X. Canton, M.B., to R.A.F. Depot, 1.11.26.

Sefton Brancker, K.C.B., A.F.C., F.R.Ae.S., will take the chair.

Donation.—The Council wish to express their grateful thanks to the Council of the Society of British Aircraft Constructors for a generous donation of £250 to the Society.

J. LAURENCE PRITCHARD,

Hon. Secretary

Inst. Aeronautical Engineers

SIR CHARLES WAKEFIELD, BART., C.M.G., has presented to the Inst. Aeronautical Engineers a Gold Medal, to be awarded annually to the designer of any invention or apparatus tending towards the safety of aviation. This medal is to be awarded at the discretion of the Council, and is open to anyone, that is, members or non-members. The Taylor Medal for the most valuable paper read before the Institution during last session has been awarded to Capt. W. H. Sayers, Technical Editor of *The Aeroplane*, and it is to be presented to him at a dinner which the Institution is holding at Kettner's Restaurant, Church Street, W. (8 p.m.), on November 19. Tickets, 12s. 6d., exclusive of wines. Dancing after dinner.

CORRESPONDENCE

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

ARRESTER GEARS FOR AEROPLANES

[2147] In your Editorial Comment of last week you question the practical value of arrester gears for army and commercial aeroplanes.

I do not suggest that the landing speed of army machines should be raised because, as you point out, there would consequently be an increased risk in the case of forced landings. The outstanding advantage of a land-arresting apparatus is surely to be found in permitting aircraft to be operated from quite a small base. In time of war it may be necessary to establish temporary landing grounds near the scene of hostilities, and it would be impracticable to find and prepare, in a few hours, an aerodrome of sufficient size to permit of the taking off and alighting of aircraft if these operations were carried on in the usual manner. It would be necessary for the arresting gear to operate in conjunction with some form of catapult to enable machines to take off. Catapults using a powder charge are now a practical success and American aircraft are being launched by such means with a high degree of efficiency.

At the present time we are developing our commercial aerodromes many miles distant from our cities, but in a few years hence it will probably be essential to bring the aerodromes closer in, and then the difficulties of finding accommodation will possibly necessitate the use of arrester and launching gears. The adoption of any such means will, no doubt, come in the first instance through military requirements, and then, if they should prove practical in operation, no doubt commercial aircraft would follow when conditions demanded.

G. H. DOWTY

Cheltenham.

IN PARLIAMENT

Parachutes

VISCOUNT SANDON on October 29 asked the Secretary of State for Air whether the Government have tested the new American invention as to parachutes for the aeroplanes themselves; and whether they propose utilising it for some other analogous device?

SIR S. HOARE: The particular invention referred to has not been tested, but a similar proposal was carefully considered and rejected some time ago. While a parachute to sustain an individual is quite practicable, the weight and bulk of one to sustain a complete aircraft would be incompatible with present-day performance, and, so far as the aircraft itself is concerned, it is considered to be better to make it safe to fly than to rely on extraneous aids of this nature.

Society of British Aircraft Constructors, Ltd.

WE are asked to announce that the officers of the Society of British Aircraft Constructors, Ltd., for the year 1926-27 are as follows:—

Chairman: Mr. T. O. M. Sopwith, C.B.E. (H. G. Hawker Engineering Co., Ltd.); Vice-Chairman (Aircraft): Capt. P. D. Acland (Vickers, Ltd.); Vice-Chairman (Engines): Mr. H. T. Vane, C.B.E. (D. Napier and Son, Ltd.); Hon. Treasurer: Squad.-Comdr. James Bird (Supermarine Aviation Works, Ltd.).

R.N.A.S. Armoured Cars Re-union Dinner

R.N.A.S. ARMoured CARS re-union dinner was held at Anderton's Hotel on October 29. Lieut.-Comdr. H. E. Perrin was in the chair, and the attendance of 74 officers and ratings testified to the continued interest taken in this gathering. All present thoroughly enjoyed the excellent concert provided by "Ourselves" which followed the dinner.

The Royal Air Force Memorial Fund

THE usual meeting of the Grants Sub-Committee of the Fund was held at Iddesleigh House on November 4. Mr. W. S. Field was in the chair, and the other members of the committee present were: Mrs. L. M. K. Pratt-Barlow, O.B.E., Squadron-Leader D. Iron, O.B.E. The committee considered in all 10 cases, and made grants to the amount of £147 19s. 6d. The next meeting was fixed for November 18 at 2.30 p.m.

Westland Aircraft Society (Petters, Ltd., Yeovil)

A SOCIETY has been formed under the above title by the employees of the Westland Aircraft Works, Yeovil. The intention is to arrange a series of weekly lectures, and engage in such other activities in connection with aeronautics as the members may decide. The President of the society is Mr. R. A. Bruce, M.I.M.E., M.Inst.C.E., M.Sc., managing director of the Westland Aircraft Works. At present, a series of classes are being held weekly for prospective ground engineers, whilst lectures of a more general interest will be given at intervals. The first class was held on Wednesday

evening, October 27, when Mr. W. G. Gibson, works manager of the Westland Aircraft Works, read an excellent paper on "Aircraft Erection and Rigging." On Friday evening, October 29, Capt. Hill gave a lecture on "The Pterodactyl." The lecturer outlined the conception and developments of the tail-less aeroplane, illustrating by means of lantern slides and models the progress and features of construction. It was pointed out that there were some fifty fatal accidents every year in the R.A.F., the most of these could be traced to lack of control under certain conditions, and the object of the designer was to produce a machine which would remain controllable under any condition of flight. Capt. A. S. Keep, who was in the chair, invited questions, and an interesting discussion took place. A further lecture was given on November 4 by Mr. W. G. Gibson, his subject being "Faults Reported after Flight Tests: Their Diagnosis and Correction."

Oil Consumption of "Cyclone" Engine

IN our article in last week's issue on the Beardmore "Cyclone" engine, the oil consumption was erroneously given as 0.1 lb./h.p./h. This figure was wrong and should actually have been 0.01 lb./h.p./h. In making our estimate of the fuel and oil for one hour we took in rough and ready figures a combined fuel and oil consumption of 0.50 lb./h.p./h. which gave 475 lbs. By giving the engine the benefit of the last decimal, using the figure 0.49 lbs./h.p./h., the figure for one hour becomes 465.5 lbs. and the combined weight for the engine, fuel and oil becomes 2,615.5 lbs. instead of 2,625 lbs. For 10 hours' running the combined weight becomes 6,805 lbs. instead of 6,900 lbs. However, the consumption of an engine in the air is likely to differ somewhat from bench test figures, and we think our original figures, apart from the printer's error in giving 0.1 b. instead of 0.01, should be near enough for practical purposes.

PUBLICATIONS RECEIVED

Rigging and Maintenance Notes. Avro Type 504K, 100 h.p. Mono. Air Publication 916. September, 1926. H.M. Stationery Office, Kingsway, London, W.C.2. Price 6d. net.
Motor Electrical Manual. Third edition. Temple Press, Ltd., Rosebery Avenue, London, E.C. Price 2s. 6d. net.
Air Navigation Directions, 1926 (A.N.D. 6). H.M. Stationery Office, Kingsway, London, W.C.2. Price 6d. net.

AERONAUTICAL PATENT SPECIFICATIONS

(Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

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20,338. D. J. MOONEY. Metal framework for aircraft. (259,710.)
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9,062. LIMITED CO. (Formerly SKODA WORKS, PLZEN). Aerial bombs (250,271.)
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